Hydro-Québec
Annual Report 1972

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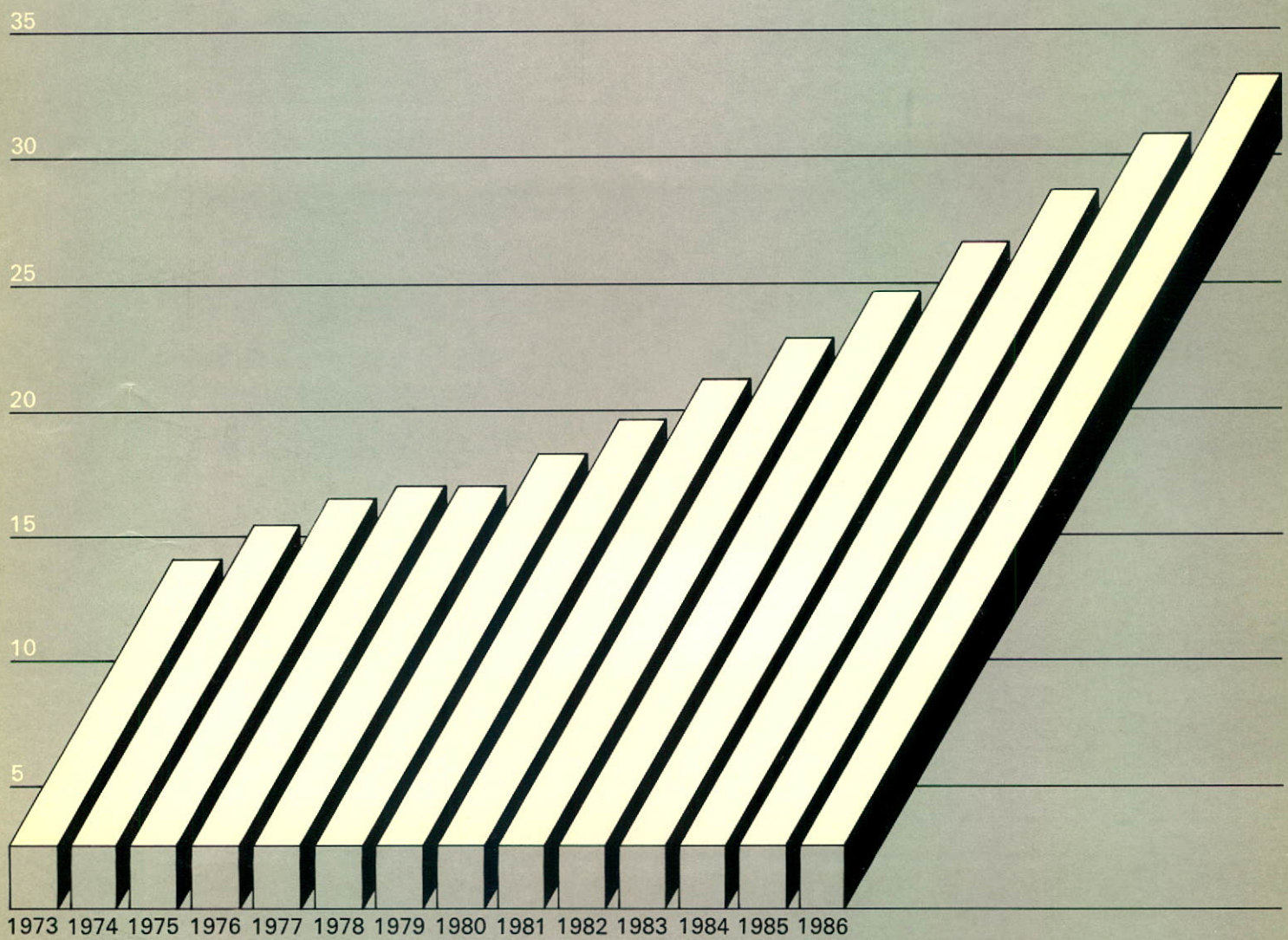
Growth of Québec's electricity needs

From 1973 to 1986, the capacity required to meet Québec's electricity needs will increase from 14.2 to 33.3 million kilowatts



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Financial and Statistical Statements

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Test hall of the High Voltage Laboratory at Hydro-Québec's Institute of Research.

Department of Natural Resources
Province of Québec
Office of the Minister

The Honourable Lieutenant-Colonel
Hugues Lapointe, Q.C.
Lieutenant-Governor of
the Province of Québec

May it please Your Honour,

The undersigned has the honour
to present the report of the
Québec Hydro-Electric Commission
for the year ended
December 31, 1972

Respectfully submitted,

Minister of Natural Resources.

Québec, March 15, 1973

Head office:
75 Dorchester
Boulevard West
Montreal 128

The Commission

President
Roland Giroux

Commissioners
Georges Gauvreau, N.P.
Yvon DeGuise, Eng.
Robert A. Boyd, Eng.
Paul Dozois

Controller
Roger Girard, C.A.

Joint Secretaries
Bernard Lacasse, Q.C.
William E. Johnson

General Auditor
Marcel Jean, C.A.

General Managers

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Guy Monty, Eng.

Distribution and Sales Dept.
Maurice Saint-Jacques, Eng.

Engineering Dept.
Lionel Cahill, Eng.

Finance and Accounting Dept.
Edmond A. Lemieux, C.A.

Personnel Dept.
Alexandre Beauvais, Eng.

Production and Transmission Dept.
J. J. Villeneuve, Eng.

Supply Dept.
Roger A. Labrie

The Québec Hydro-Electric Commission (or Hydro-Québec) was created on April 14, 1944, by an Act of the Provincial Legislature as a government-owned enterprise responsible for producing and distributing electricity in the Province of Québec.

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Jean-Charles de Groote

Electronic Data Processing
André Duval

Institute of Research
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Organization
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Public Relations
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Pierre Godin, Eng.

Richelieu
Gaston Galibois, Eng.

Saguenay
Jules Harvey, Eng.

Saint-Laurent
Louis G. Boivin, Eng.

Roland Giroux, Président

Québec Hydro-Electric Commission

Commissioners

1 Georges Gauvreau
2 Yvon DeGuise
3 Robert-A. Boyd
4 Paul Dozois

1


2


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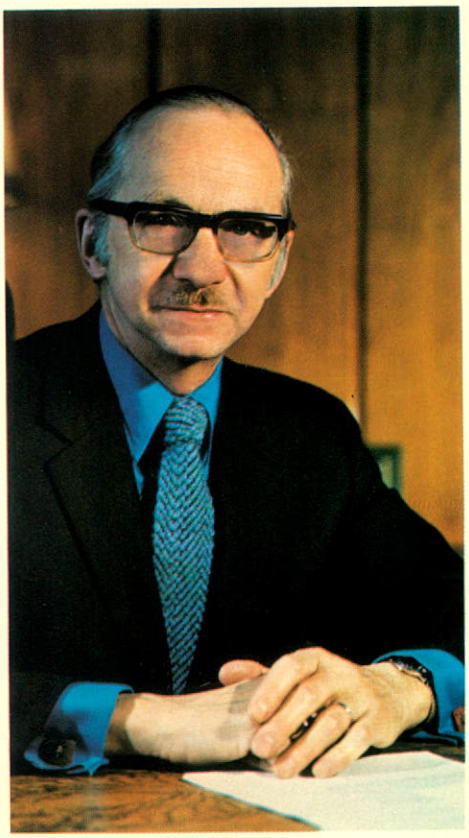

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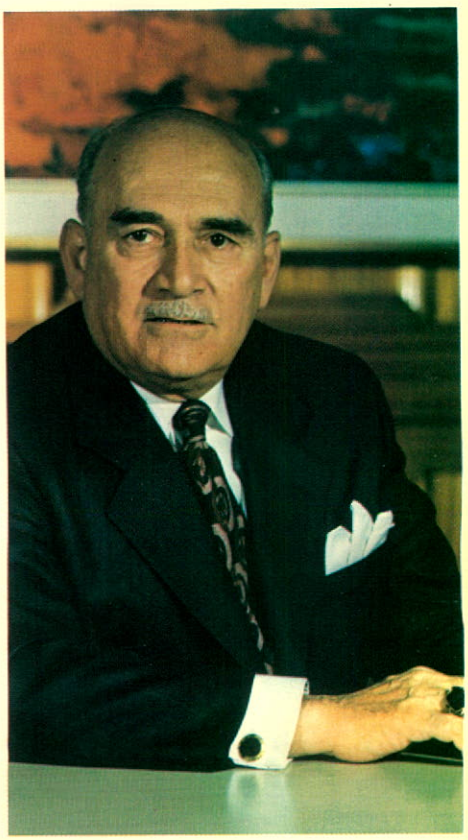


President's Report

The growth rates of electricity sales during 1972 reflect the strong expansion of Québec's economy and highlight the importance of ensuring that the province has all the electric energy it needs.

Energy consumption in the commercial category, which covers commercial establishments and small industries, increased by 16.8%.

The energy requirements of residential customers rose by 9.9%, and in 1972 the average annual consumption of residential customer accounts went up by 6.9%, one of the largest increases ever recorded. This increase reflects both a higher standard of living and the effectiveness of our marketing activity, especially in the area of electric heating for homes.

In the increasingly important manufacturing sector, sales of electricity rose by 17%.

These growth rates, together with the marked recovery in the major cyclic industries such as pulp and paper, underline the urgency of providing the new generating facilities that Québec will need in the foreseeable future, and the serious consequences that delays or lack of adequate revenue may have for the whole province.

This annual report outlines the 1978-1985 construction program presented last May to the National Assembly's Permanent Committee on Natural Resources. It also describes the preliminary works undertaken in the James Bay area to develop the La Grande River project which is expected to add about 8,300,000 kilowatts to system capacity.

During the year, legal proceedings were instituted before the Superior Court of the District of Montreal with a view to halting construction of this project and hearings are still being conducted.

The unfavorable effects of inflation on our financial results are clearly indicated in the ensuing pages of this report and in the table showing Hydro-Québec's financial situation, which overall remains excellent.

The Commission has exerted every effort to minimize the inevitable effects of soaring costs on electricy bills.

We have, for example, made increasing use of advanced operating techniques that result in appreciable savings and also improve the quality and reliability of service to customers. While respecting the interest and careers of existing personnel, we have now succeeded in bringing 11 powerhouses and 138 large substations under remote control; these powerhouses represent 32% of total system capacity.

We have concluded agreements that provide for earlier commissioning of generating units at the Churchill Falls powerhouse, as well as the sale of appreciable amounts of firm energy to Ontario and New Brunswick until such time as all the energy received from this powerhouse is required by Québec customers. Until 1977, we are committed to deliver to the electrical systems of these two neighboring provinces at least 47 billion kilowatt-hours, worth $225 million.

These sales will lighten the obligations we have assumed under the already favorable conditions of the long-term contract concluded with Churchill Falls (Labrador) Corporation Limited. Furthermore, negotiations are continuing for a mutual-assistance pact between our system and the network serving the New York City area, where the heaviest demand for electricity occurs in summer. This agreement, of great future importance, covers an initial period of 20 years starting in 1977, and will entail the construction of our first extra-high-voltage interconnecting line with the United States. From 1977 to 1981, the proposed agreement will enable us to sell $123 million worth of electric energy to New York during summer months, without calling on power from the James Bay development.

This report points out that our distribution system covers 55,000 square miles of territory, that it represents more than one-fifth of the cost of all our property and plant, and that maintenance of this system requires personnel trained and equipped to cope with a harsh winter climate, and the wide distribution of customers.

Despite the attention paid by Hydro-Québec to its construction program during the year, the quality and reliability of service to customers remained the chief concern of our staff.

Following the restructuring of administrative units in 1971, increased efforts are being devoted to improving Hydro-Québec's day-to-day contacts with customers. For this purpose, a new Customer Service has been established in the regions and should produce excellent results. The staff has been specially trained to deal exclusively with customer requests and complaints and to handle these with competence and courtesy. This newly formed Service has been enthusiastically received and has enlisted the fullest participation of all our personnel.

On behalf of the Commission, I should like to express our gratitude to all our staff and outside collaborators.

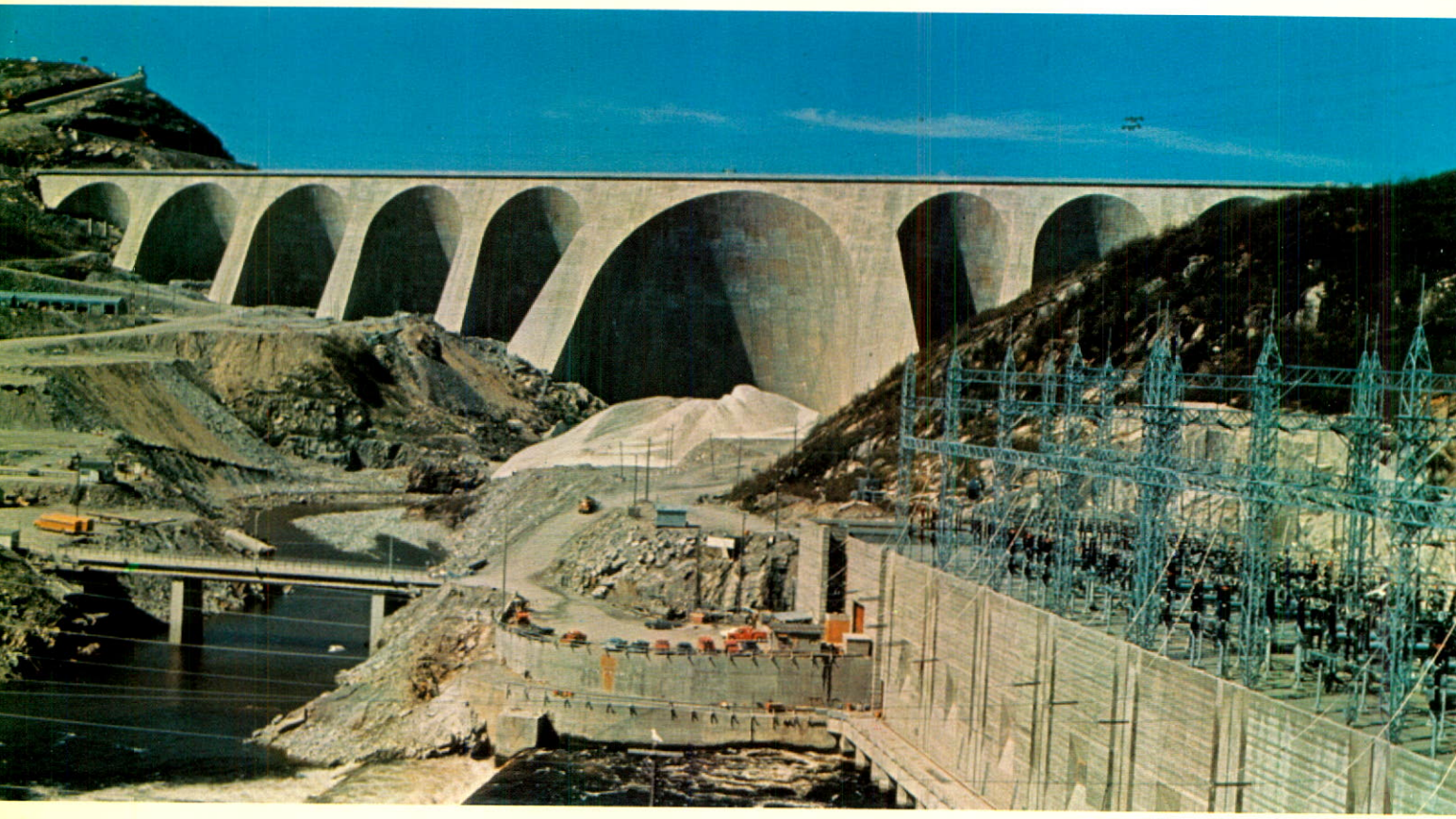
President

Montreal, March 12, 1973

Excavation of the Manic 3 powerhouse cavern nears completion.

10 Years' Progress

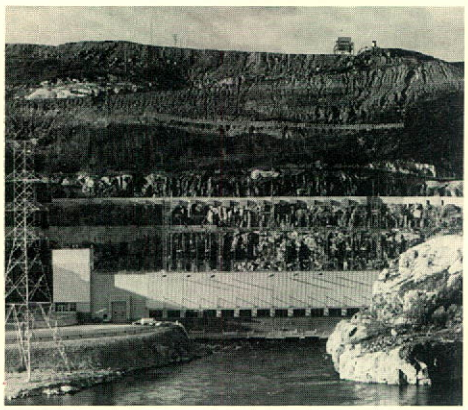
Daniel Johnson dam.



Financial situation (in millions of dollars)	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963
Property and plant, at cost	4,599	4,251	3,899	3,404	2,992	2,842	2,622	2,428	2,160	2,032
Long-term debt and notes payable	3,299	3,026	2,805	2,738	2,546	2,399	2,176	1,928	1,810	1,569
Reserves or net worth	1,140	1,041	913	796	712	634	558	507	450	391
Total revenue from electricity sales	561	518	478	416	387	354	314	288	269	201
Total operating and interest charges	499	427	397	362	328	297	274	241	223	165
Effects of growth										
Installed capacity (in megawatts*) at December 31	11,107**	11,107	10,617	9,809	8,365	8,179	7,763	7,350	6,562	6,224
Maximum firm-power demand in the service area (in megawatts*)	9,747	9,173	8,873	8,100	7,664	6,930	6,562	6,053	5,648	5,212
Total energy sales (in billions of kilowatthours)	60.4	52.5	50.6	46.3	43.1	41.2	39.7	36.1	35.3	26.4
Total number of customer accounts (in thousands)	1,943	1,895	1,852	1,773	1,720	1,656	1,581	1,539	1,492	1,363
Number of permanent employees	12,627	12,245	12,012	11,890	11,723	11,637	11,466	10,976	10,261	9,915

*1 megawatt (or 1 MW): 1,000 kilowatts: 1,000,000 watts
**Excluding Churchill Falls

1



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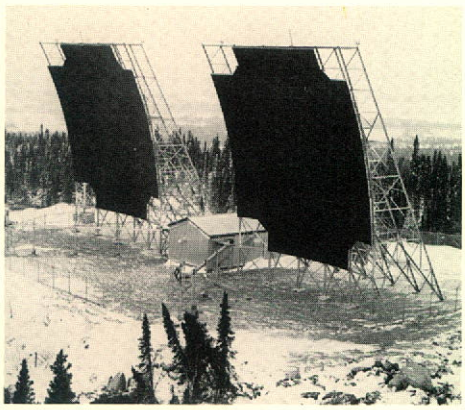
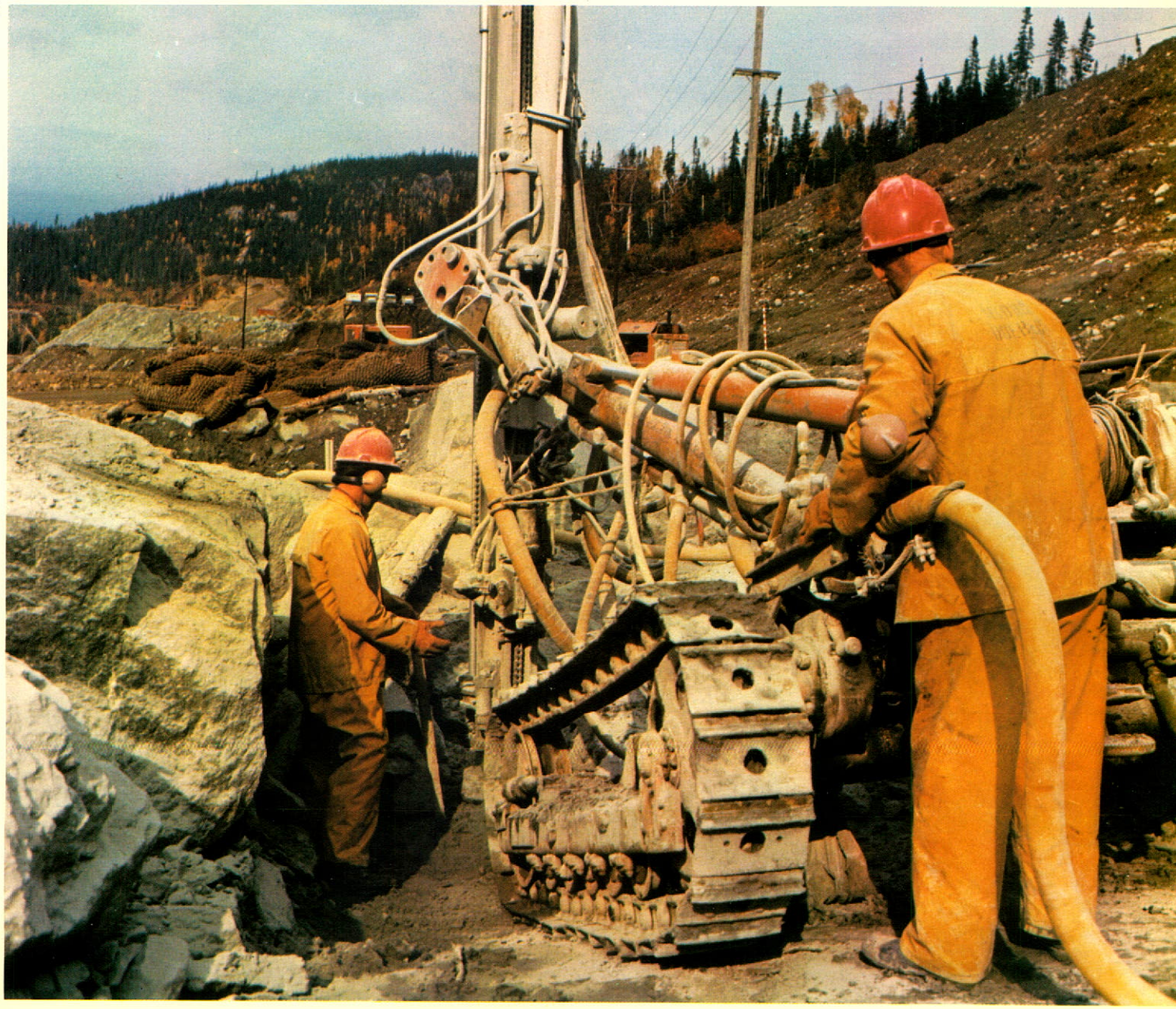


1 Outardes 4 powerhouse

2 Parabolic reflectors on the microwave link to Churchill Falls.

3 Drill in action

3



Financial Results*

*Words in italics correspond to terms used in the *Financial and Statistical Statements*

As a result of one of the longest and most persistent periods of inflation on record, overall costs in 1972 increased at a much higher rate than gross revenue.

Expenditure and *interest charges* amounted to $499,379,000, compared with $427,488,000 in 1971, an increase of $71,931,000 or 16.8%.

Total revenues (*revenue* plus *other income*), on the other hand, totaled $598,282,000, an increase of $43,082,000 or only 7.8%.

The large gap between these increases of 16.8% and 7.8% compares unfavorably with the period 1964 to 1971, when overall costs rose at an annual rate of 9.7% and revenue at 10.2%. This balance had been achieved through the general rate increases implemented in 1967 and 1970—the first since the creation of Hydro-Québec in 1944. By the end of 1972 it was apparent that a new rate adjustment would be necessary.

Most of the increase in the year's overall costs was for *operating expenses*, *interest charges*, and *power purchased*.

The additional $22,403,000 in *operating expenses*, an increase of 14.9% over 1971, included nearly $15,000,000 for personnel, of which about $11,500,000 was for salaries and some $3,500,000 for employee benefits and for supplements paid to certain categories of retired employees.

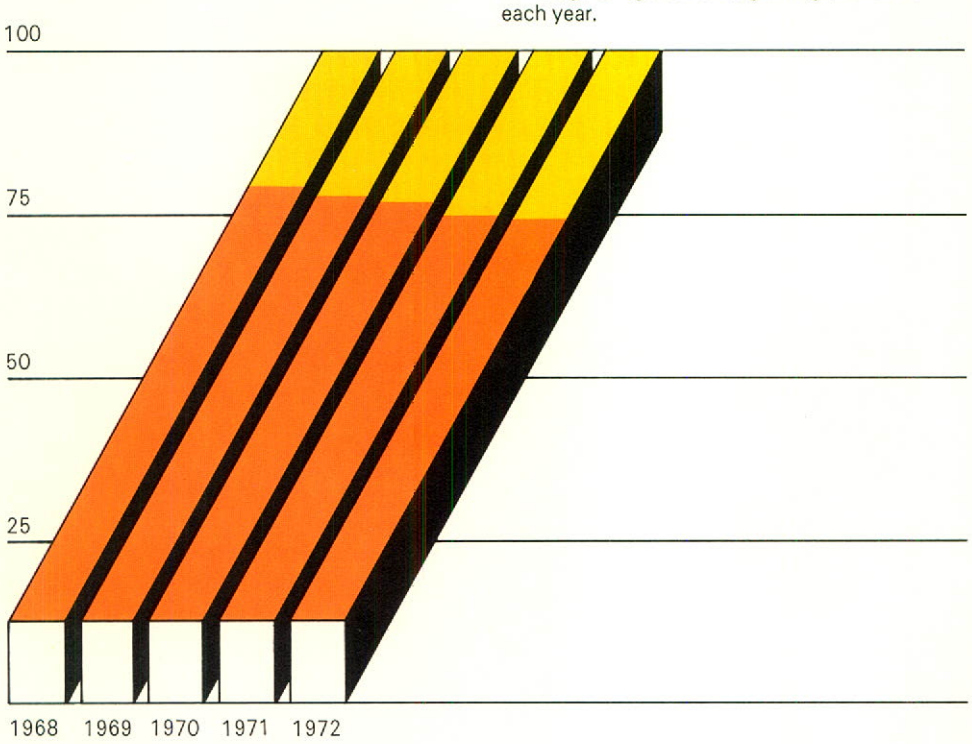
Interest charged to operations amounted to $173,846,000, an increase of $24,263,000 or 16.2% over the previous year. This increase reflects not only interest rates, which remained extremely high, but also the increased cost of plant in service on which this interest is payable. Most electric utilities face this same situation.

Expenditures for *power purchased*, at $34,446,000, were $18,708,000 higher than in the previous year, mainly because of energy deliveries from Churchill Falls. This item included amortization ($1,783,000) of our part of the interest charges of Churchill Falls (Labrador) Corporation Limited (see notes 4 and 12 of the Consolidated Financial Statements). It should be noted that expenditures relative to Churchill Falls energy obviate the much larger expenditures in the form of interest charges, depreciation allowances and operating expenses that would have been required had Hydro-Québec been obliged to build gen-

Composition of capital* (in %)

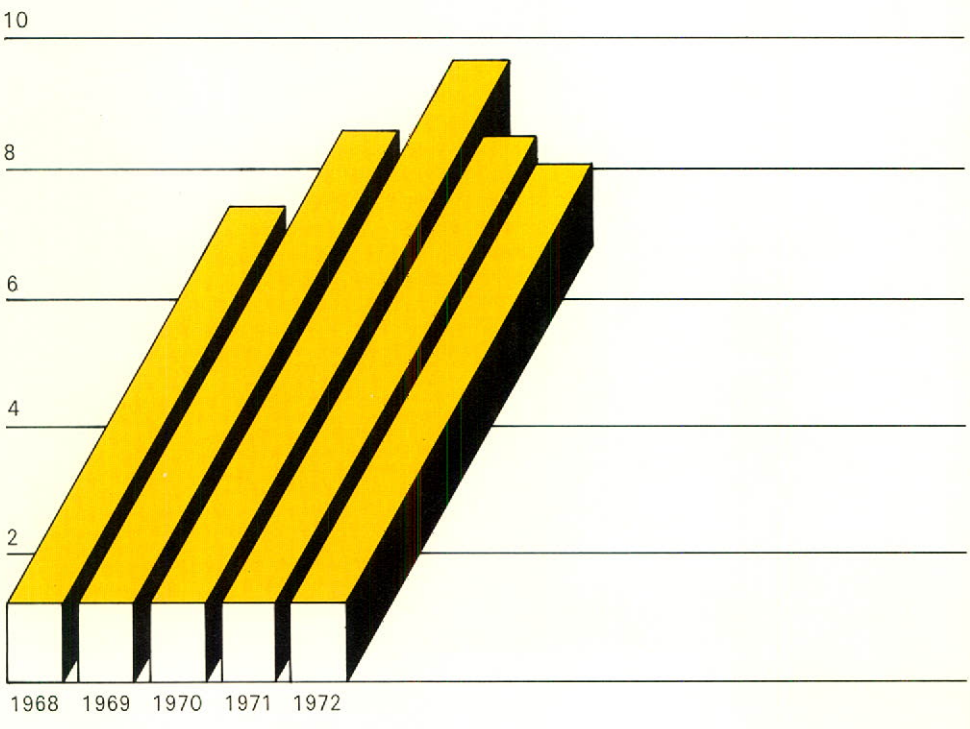
net worth (reserves)
borrowed capital

*Average of figures for beginning and end of each year.



Interest rates
(in %)

Average effective interest rate on long term borrowings.



erating facilities equal to those at Churchill Falls.

As the result of increases in *operating expenses* and *interest charges, net income before interest on reserves* declined by $28,849,000, or 22.6% compared with 1971, to reach $98,903,000.

Funds generated internally by the year's operations totaled $171,680,000, which was $18,070,000 or 9.5% less than the preceding year. This amount comprises *net income before interest on reserves* less *net profit on repurchase of debentures* (which is not a cash inflow) plus charges not requiring cash outlays, such as *provision for renewals (depreciation)*.

As shown in the *Consolidated Statement of Source and Application of Funds*, these internally generated funds served to redeem maturing long-term debt in the amount of $33,591,000, to invest $39,954,000 in the sinking fund, to reduce *notes payable* by $27,978,000, to increase working capital by $15,113,000, and to pay Churchill Falls (Labrador) Corporation Limited $11,546,000, which was Hydro-Québec's share of that Company's interest charges for 1972 (see notes 4 and 12 of Consolidated Financial Statements).

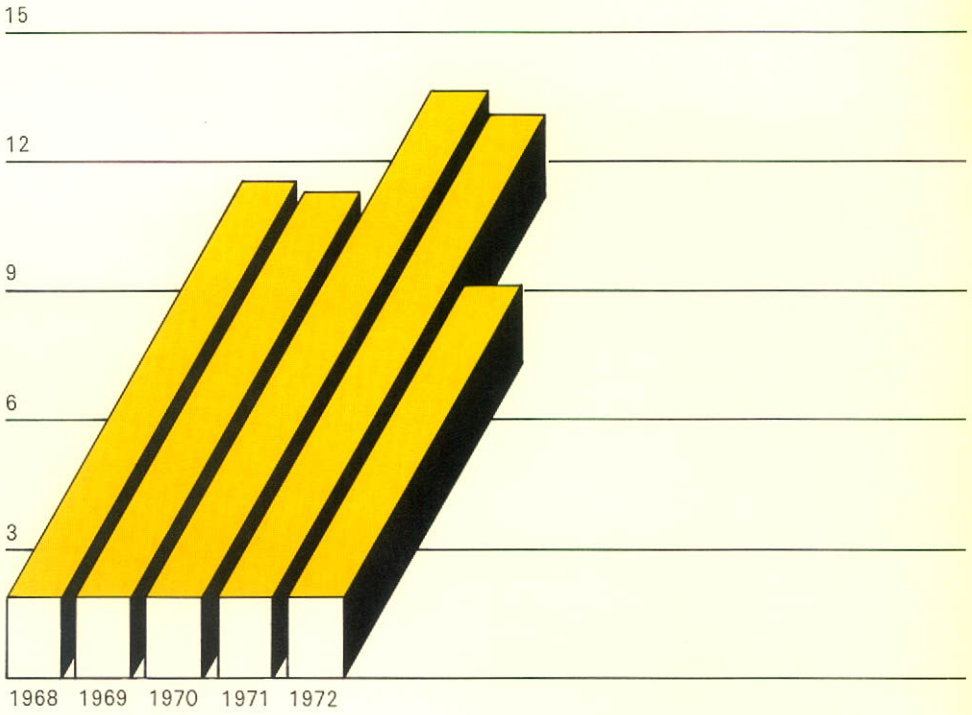
The amounts paid from internally generated funds, including $591,000 for *net exchange premium*, totaled $128,773,000, leaving only $42,907,000 to help finance plant additions. Total plant investment for the year amounted to $423,600,000, including $107,056,000 on behalf of the James Bay Energy Corporation, $142,618,000 for the transmission system, and $66,972,000 for the distribution system.

The difference between cash requirements and the internally generated funds was made up by long-term borrowings, which yielded a net amount of $374,809,000. The average effective interest rate on the year's debenture issues was 8.05%, which compares with 8.58% in 1971 and 9.68% in 1970.

Nearly 60 per cent of this capital was raised on the Canadian market, where six debenture issues having a total value of $225,000,000 were negotiated. The Québec Deposit and Investment Fund subscribed for $145,000,000 of this amount, compared with $65,000,000 in 1971 and $52,500,000 in 1970. A

Return on net worth*
(in %)

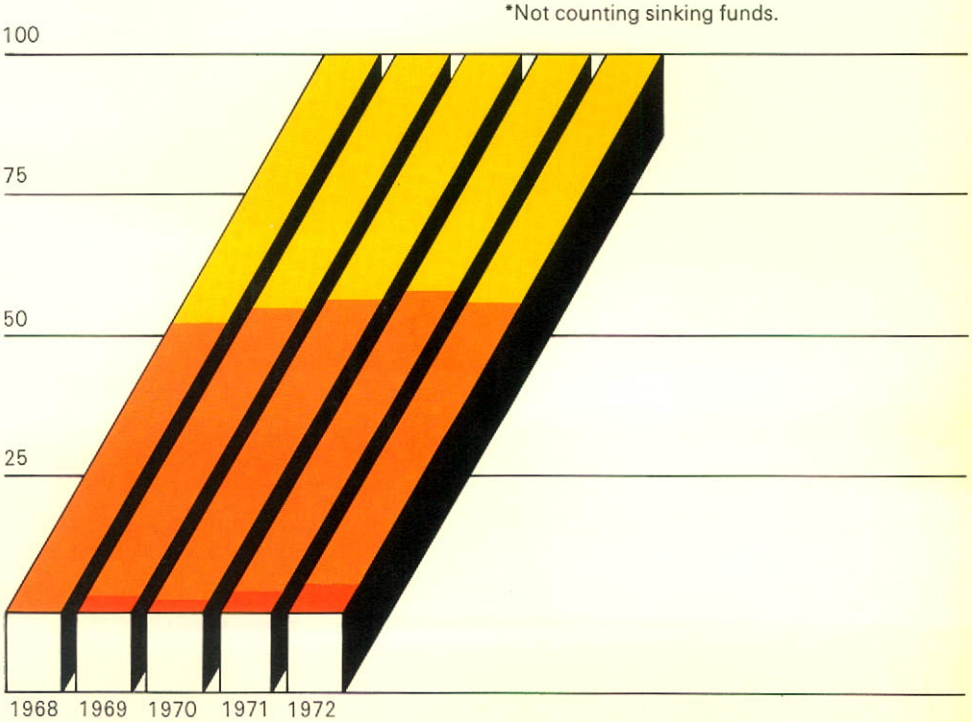
*Net income before interest on reserves divided by the average of reserves at the beginning and end of each year.



Composition of long-term debt
(in %)

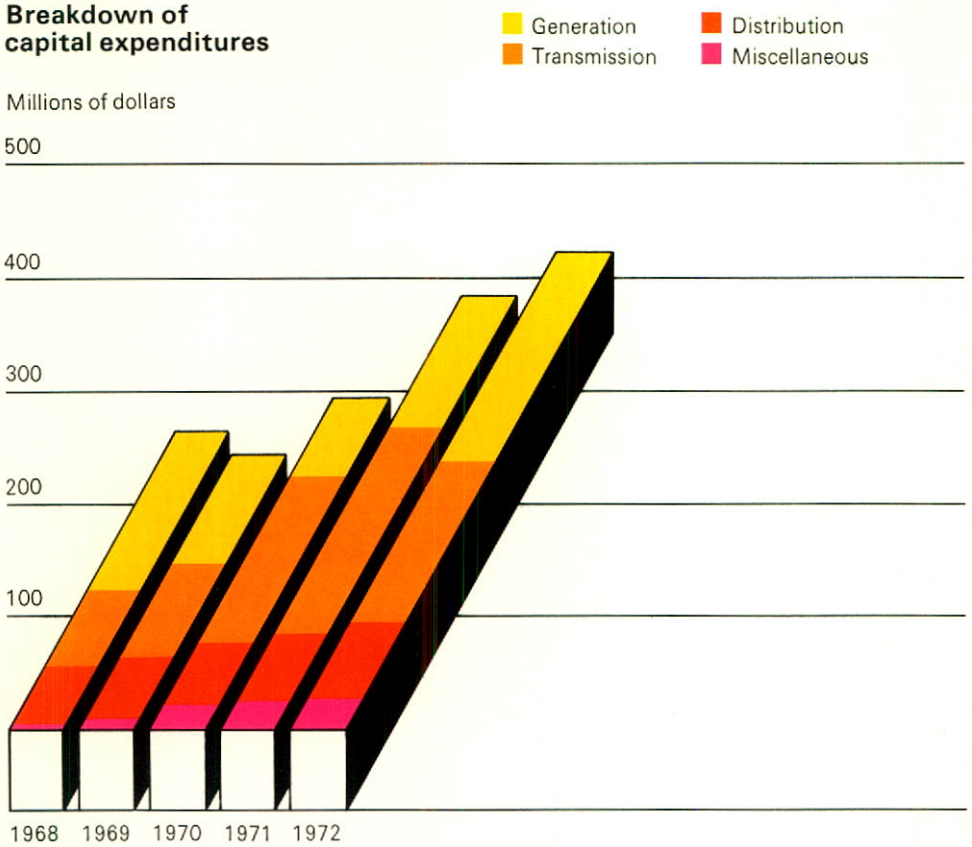
Canada
U.S.
Other

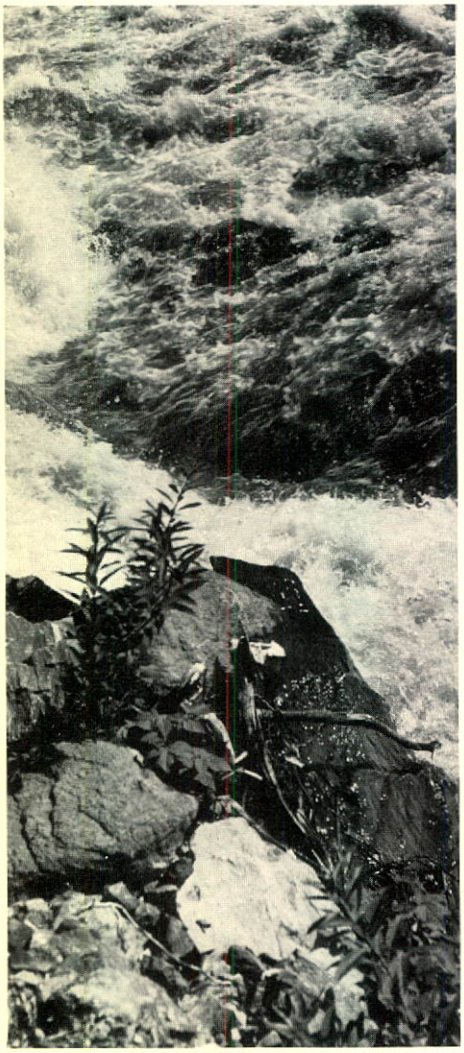
*Not counting sinking funds.



$100,000,000 issue was negotiated on the American market in 1972, and two issues were negotiated in Europe at interest rates slightly under 7%: one for $31,391,000 in West Germany, and the other for $21,021,000 in Switzerland.

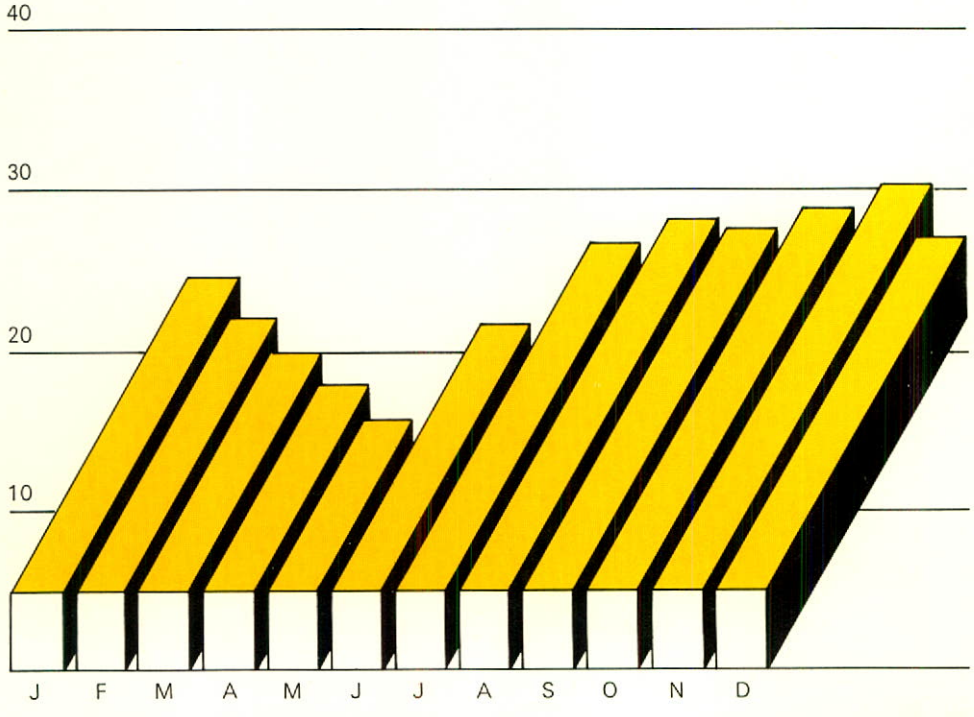
Breakdown of capital expenditures





Water reserves in 1972

Accumulation of usable reserves, expressed in billions of kWh, in all reservoirs during the year. Total energy capacity of all reservoirs is 41.2 billion kWh.



Sales Results

Sales in Québec show large increases in three major categories: commercial customers, residential customers, and manufacturing industries.

In the commercial category, which covers small industries and commercial establishments, consumption was 10.6 billion kWh, or 16.8% more than in 1971, and provided a total of $152,299,000 in revenue, up 13.2% over the previous year.

Sales to residential customers totaled 12.7 billion kWh, an increase of 9.9%, but revenue from this sector, at $189,571,000, increased only 7.5%. At December 31, the number of residential customer accounts was 1,636,446, or 47,859 more than the preceding year.

In the manufacturing sector (iron and steel, petroleum, cement, textiles, etc.), sales totaled 3.2 billion kWh in volume and $22,550,000 in revenue, representing increases of 17.1% and 20.6% respectively.

Average annual consumption per residential customer account (based on the average number of accounts during the year) was 7,880 kWh, or 512 kWh more than the year before. This increase of 6.9% was unusually large, since the average annual increase between 1967 and 1971 had been 3.3%.

Farm customers used a total of 996 million kWh, or 6% more than in 1971, and these sales provided $13,467,000 in revenue, which was only 3.4% more than the previous year. The number of farm contracts declined again in 1972, from 80,936 to 80,083, but the average annual consumption per farm contract (based on the average number of contracts during the year) continued to increase, reaching 12,369 kWh, compared with 11,504 kWh in 1971.

However, the growth rate for the total volume of firm-energy sales in Québec, which was 5.8% for the year, has not yet regained its normal level, although it improved considerably over 1971 when it was only 3.6%. From 1965 to 1970, firm-energy sales in Québec increased at an average rate of 7.2% a year.

The few large industries whose consumption had declined by 2.4% in 1971 showed signs of recovery during the final months of 1972, and their total consumption for the year showed a net increase of 1.2%. These industries, which account for about a third of Hydro-Québec's sales in the province, are pulp and paper manufacturers, electrochemical, electrometallurgical and chemical plants, and mines.

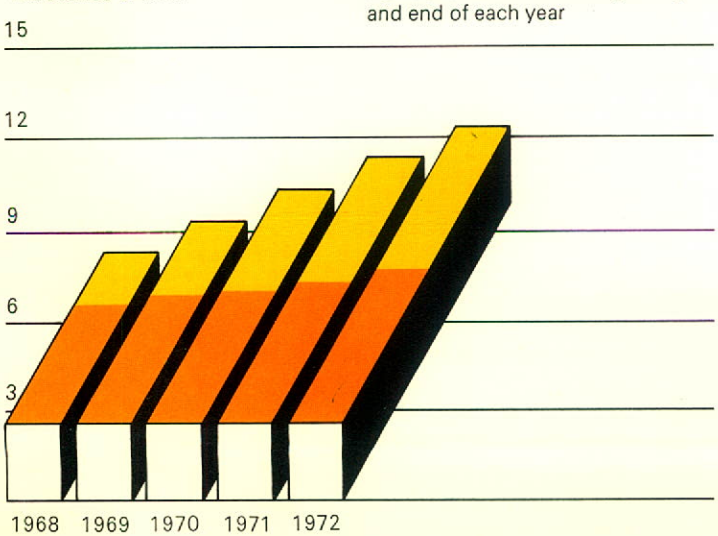
This slowdown in economic activity, which coincided with the commissioning of the first units at Churchill Falls power station, was offset in 1972 by an increase of 20.7% in sales of secondary energy, which totaled 3.4 billion kWh (of which 2.1 billion kWh was sold in Québec). These sales produced $8,377,000 in revenue.

Exports of firm energy, which will increase even more in the coming years because of contracts with the Ontario and New Brunswick systems, climbed to 7.7 billion kWh in volume and to $23,990,000 in revenue, representing an increase of 147.5% in volume and 159% in revenue.

Average annual consumption

Farm Residential

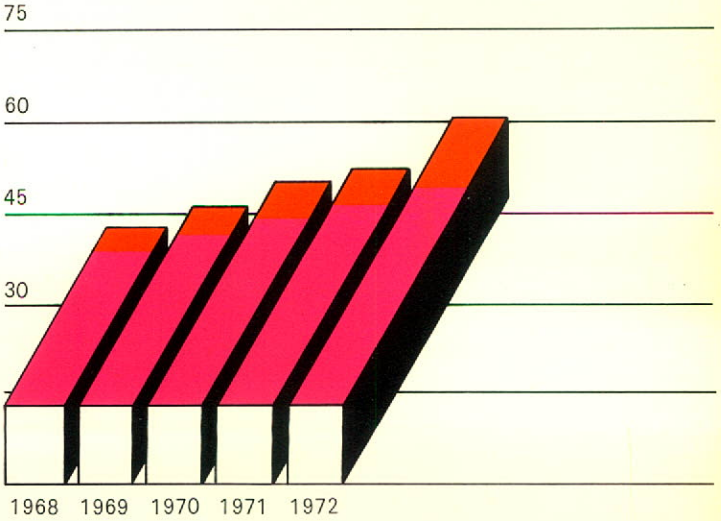
*Calculated from average number of accounts at beginning and end of each year



Breakdown of sales

Sales of secondary energy and sales outside the system

Sales of firm energy in Québec



Marketing

All Hydro-Québec's marketing activity aims at increasing the utilization of its vast distribution system, which covers an area of 55,000 square miles with a network of lines operating at 25 kV or less to supply an average of only 44 customers per circuit mile. If Montreal is excluded, this average falls to 30 customers per circuit mile.

The enterprise continued in 1972 to engage in all forms of proven advertising and sales-promotion activity so as to improve the utilization factor of substations and distribution lines and increase revenues to help offset the effects of inflation.

Despite strong competition, gains were made in the water-heating and space-heating markets.

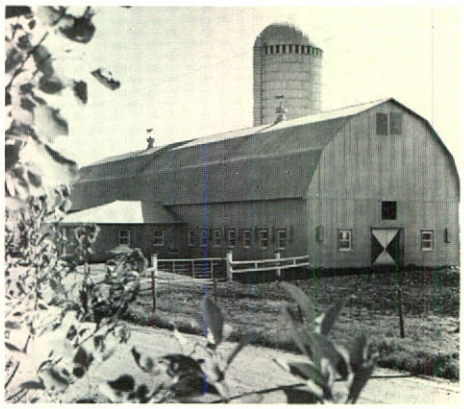
At December 31, the number of electric water heaters installed on a rental basis for residential customers totaled 145,704, an increase of 8,598 or 6.3% over the previous year. Moreover, dealers sold a greater number of Cascade 60 water heaters during the year, and 2,240 customers took advantage of plans for the purchase of water heaters or the modernization of their electric wiring installations.

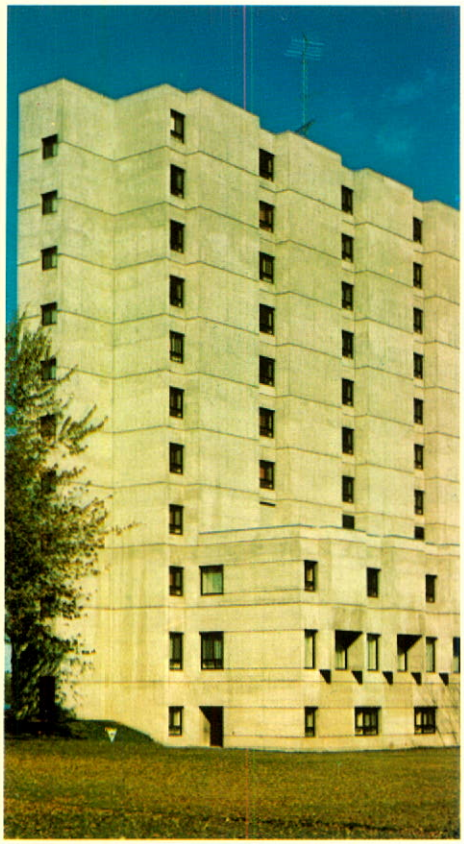
Some 23,000 new housing units completed during the year were built in accordance with NOVELEC (all-electric) standards. This was more than double the number in 1971, when 10,000 such units were completed. The 1972 figure includes more than 12,000 housing units in the category covering single-family dwellings to buildings with nine dwellings. In addition, of the 55,700 housing starts in Québec listed by Statistics Canada, nearly half will be heated by electricity.

The number of "well-electrified" farms increased by 167 or 15.8% to 1,225. Average annual consumption of such farms is about 30,000 kWh.

At the end of the year, surveys of residential and farm customers were conducted to ascertain the degree of use of various household appliances, and the results should prove useful for the future orientation of our marketing activity.

More and more "all-electric" buildings are springing up in Québec.
Lower right: Architect's model of the Desjardins complex under construction near Hydro-Québec's head office in Montreal. It too will be "all-electric."





Production

At the year-end, installed capacity of the power stations operated by Hydro-Québec totaled 11,107 MW*, almost no change from the preceding year. In fact, this figure will remain virtually unchanged until the Manic 3 power station is commissioned in 1975 and 1976. In the meantime, the annual increases in Québec demand will be met for the most part from growing amounts of power received under contract from Churchill Falls (Labrador) Corporation Limited.

demand has increased at an average rate of 6.4%.

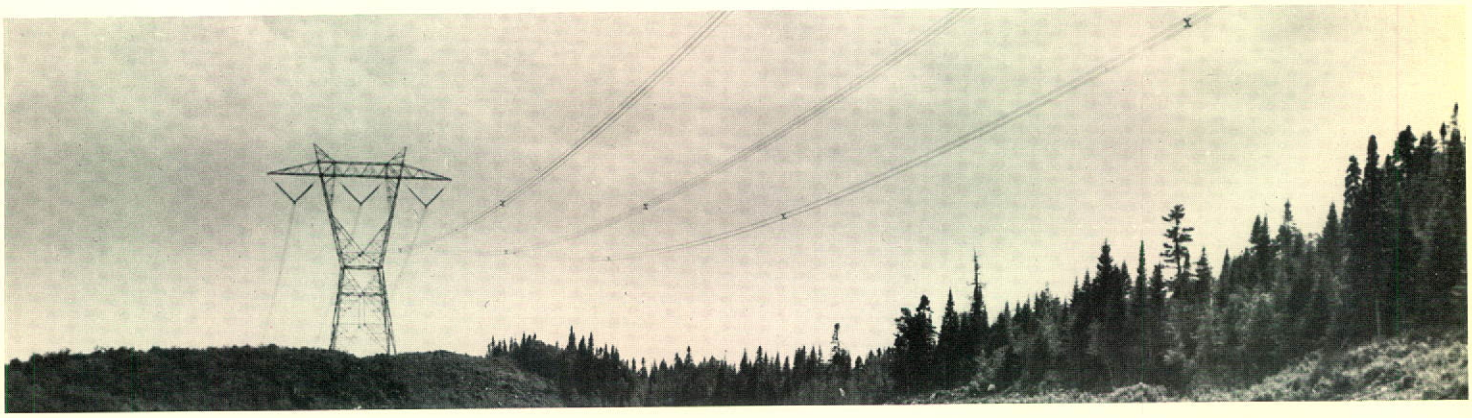
Hydraulic conditions—The amount of water available to our powerhouses from precipitation was 2% less than the average of preceding years, but because of the energy imported from Churchill Falls generating station, our water reserves increased. Between December 31, 1971, and December 31, 1972, the equivalent energy value of water impounded in the reservoirs increased 2.4 billion kWh, from 24.7 to 27.1 billion kWh.

The production of Tracy thermal station was required only during peak periods, and hydroelectric plants furnished 99.6% of total production.

1 735-kV transmission line.

2 Telecommunications dispatching centre for the Manicouagan region at Hauterive.

1



At December 31, the net inflow from purchase and sales contracts amounted to 1,023 MW, and this amount added to installed capacity brought the total capacity available to meet Québec demand to 12,130 MW.

Maximum demand—From 1971 to 1972, maximum firm-power demand in Québec increased by 574 MW to reach 9,747 MW at 5:30 p.m. on December 19, when the temperature was 11°F. The previous year's peak of 9,173 MW had occurred at 5 p.m. on December 20 when the temperature was 20°F.

(A few days after the 1972 peak, Québec demand for the first time exceeded 10,000 MW. On January 8, 1973, when the temperature was —11°F., it reached 10,045 MW, or 298 MW more than the peak of December 19, 1972. The new peak represents an average annual increase of 7.1% over the five years since the peak of January 8, 1968.)

At the time of peak system demand on December 19, total demand, which includes deliveries outside the system and secondary power, amounted to 10,692 MW, an increase of 12.1% over the previous year. Since 1966, total

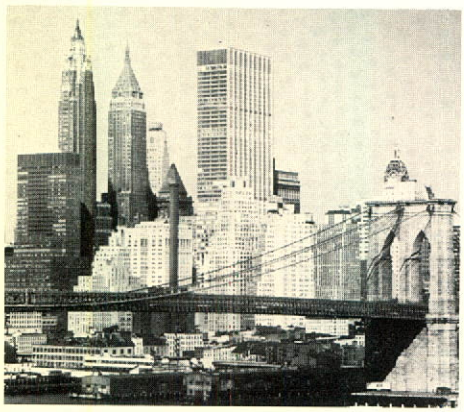
2

*1 MW: 1 megawatt: 1,000 kilowatts

Mutual Assistance Pact between Québec and New York

The province of Québec and the New York City area experience their heaviest demand for electricity at different times of the year, making possible an advantageous form of cooperation between the two electrical systems. Each system can help the other to cover its annual peak, and thus both can make more efficient use of their means of production, reduce capital costs, and slow down the constant rise in electricity costs.

That is why the National Assembly gave the necessary authorization for Hydro-Québec to negotiate a final contract and mutual-assistance agreement with Consolidated Edison Company of New York Inc., which serves New York City and area, or with the Power Authority of the State of New York, a government enterprise which operates generating stations and sells the production to electric utilities in the State of New York, including Con Edison.



The agreement in principle, which has already been concluded, does not take into consideration power from the James Bay development, but is based entirely on the production capacity of existing power stations, the generating station under construction at Manic 3, and Churchill Falls.

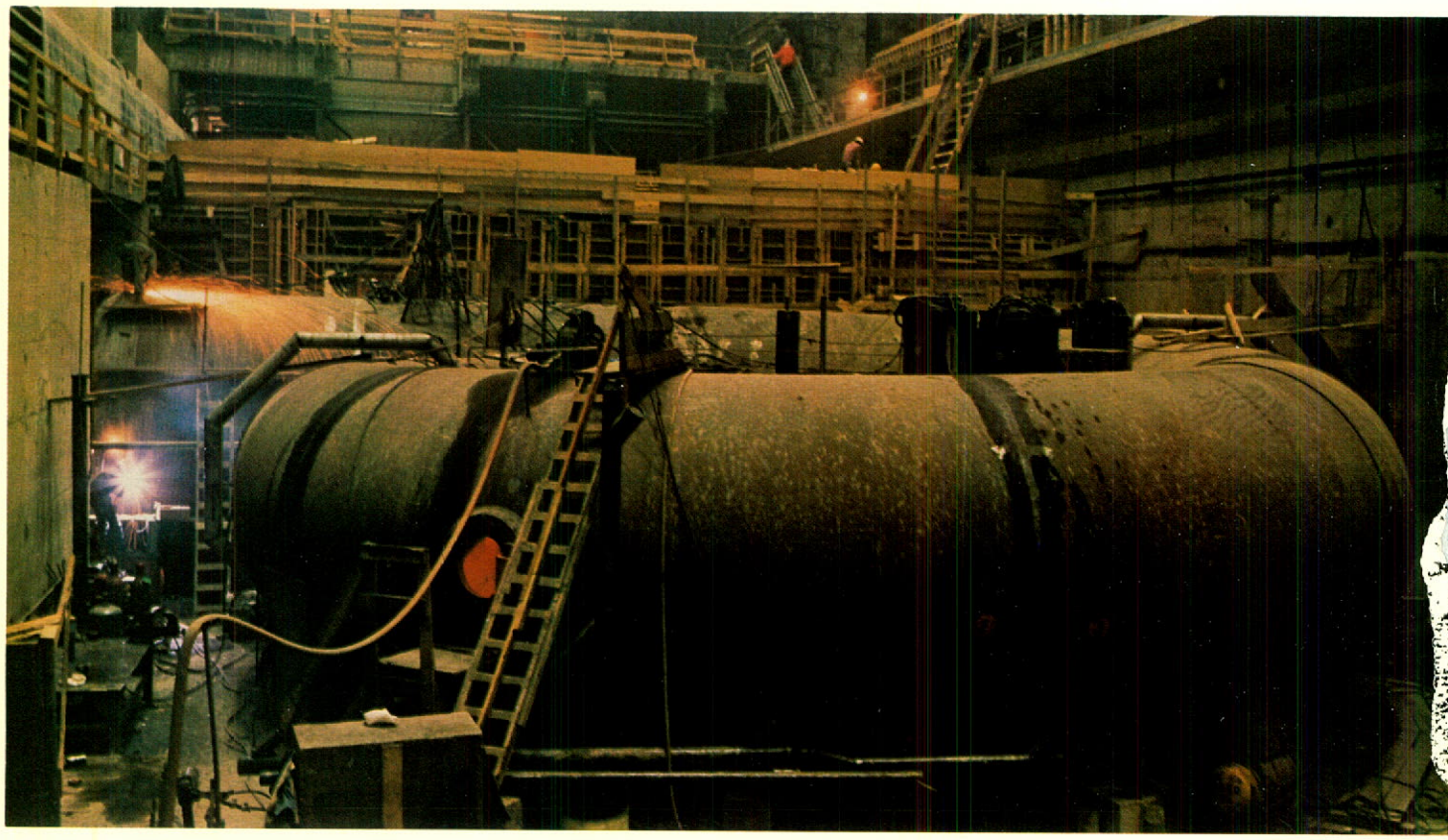
The agreement provides, however, for construction of an extra-high-voltage interconnecting line between Québec and the United States. This will open up the large American market for any temporary power and energy surpluses that become available in future years.

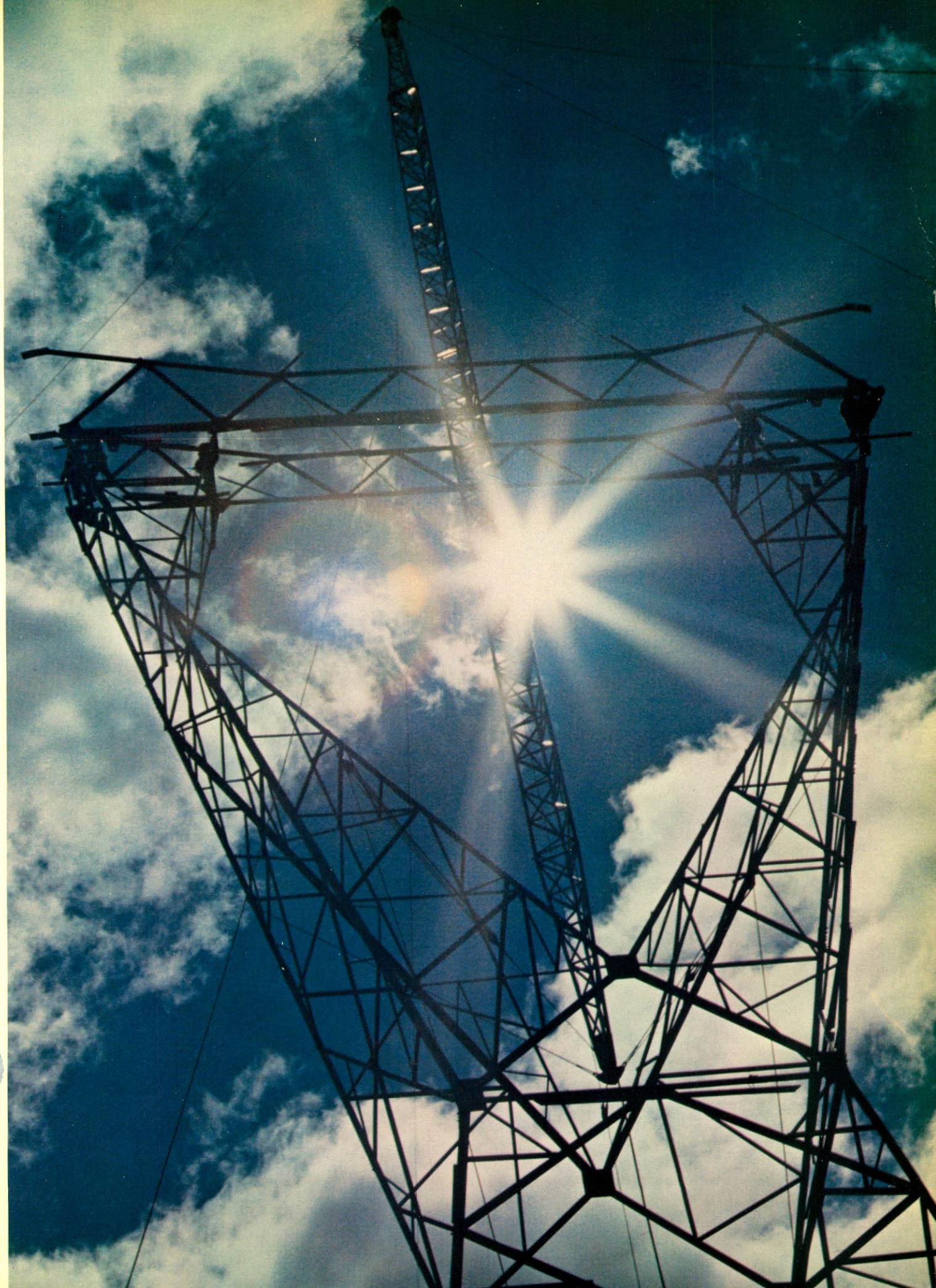
The preliminary agreement applies only to the summer months and covers a maximum period of 20 years beginning in June 1977. So far, Hydro-Québec has committed itself to supply energy only during the first five years of the agreement, and it reserves the right to ensure supply to its Québec clientele on a priority basis at all times.

From 1977 to 1981, Hydro-Québec will supply the New York City area with a total of 14.14 billion kWh, worth some $123,000,000. New negotiations will be necessary to establish the quantities of energy to be delivered in either direction after 1981.

A capacity of 800 MW will be placed at the disposal of American customers during the summer months. This amount is only part of the difference between Québec's winter and summer peaks.

Scroll case for the eighth generating unit at Churchill Falls powerhouse.





Construction Program

In common with other electric utilities, one of the Commission's prime responsibilities is to forecast the increase in customer demand far enough in advance so that new installations will be ready when needed. The design and construction of such installations may take up to 12 years.

Energy from the Churchill Falls and Manic 3 power stations will suffice to meet the increase in Québec's needs until 1977, when the available capacity will be about 17,000 MW. After 1977, demand is expected to increase at an average rate of 7.8%* a year. Consequently, 14,000 MW of additional capacity (including reserves) will be required from 1978 to 1985. During this period, annual consumption is expected to soar from 77 to 147 billion kWh, an increase of 70 billion kWh.

To meet this increase in Québec's needs, development of the northernmost of two possible hydroelectric complexes in the James Bay watershed was chosen as the least expensive capital-equipment program, taking into account construction and operating costs as well as the lifetime of the installations and the reserve capacity needed.

This complex will be centred on the La Grande River, which flows from east to west and is located roughly 650 miles north of Montreal. The flow of the La Grande will be almost doubled by diverting nearby rivers into it. The four proposed generating stations will have a combined capacity of more than 8,330 MW, and they will be capable of producing an average of 58 billion kWh a year. The program provides for the successive commissioning of generating units from 1980 to 1984.

In 1978 and 1979, installations will have to be put in service to meet an increase of about 2,500 MW in peak and base load. The projects under study to supply this power include a 1,000-MW peaking station, a 600-MW generating unit at Gentilly nuclear power station, and development of the Outardes 2 site, which would add a net amount of 397 MW to system capacity. Decisions concerning the most urgent of these projects must be taken in 1973.

In 1984 and 1985, peaking units will be commissioned to balance the overall program. Construction of these units will begin as required.

Pumped-storage power stations—Because the high cost of peak energy must be reduced, suitable sites for the construction of pumped-storage power stations constitute one of the most valuable natural resources a country can possess. Moreover, when this type of power station is built as part of an overall development plan, the sites can be converted into recreational areas of great value to the local population.

Several years ago, Hydro-Québec's Engineering Department began to seek sites of this type near the consumption centres. An especially favorable region was discovered in the valley of the Jacques-Cartier River about 30 miles north of Québec City. Preliminary design studies, together with an environmental study, were under way at the year-end.

The powerhouse would contain four reversible units with a total capacity of 1,000 MW, and would operate during peak hours in winter only, from the end of November to mid-March. A head of 1,400 feet would be exploited between the upper reservoir (formed by Lac Aubert and another small lake) and the lower reservoir. All the structures connecting the two reservoirs (intakes, headrace and tailrace tunnels, penstocks and the powerhouse itself) would be underground and completely concealed, except for the crests of the intakes. A dam across the river would create the lower reservoir, 18.5 miles long, including 10 miles inside the Laurentian Park. The level of this artificial lake would be stable from mid-March to the end of November.

A pumped-storage plant at Saint-Joachim on the north shore of the St-Lawrence River downstream from Québec City had been considered but the problems caused by the salt content of the river water at this location would have delayed completion of the project which is needed by 1979.

Second unit at Gentilly—A second nuclear-powered generating unit will be put in service at Gentilly in 1979. Its capacity will be 600 MW and it will be of the CANDU-PHW type (Canadian Deuterium Uranium, Pressurized Heavy Water). The first reactor of this type, designed and developed by Atomic Energy of Canada Limited, has been operating at Rolphton, Ontario, for the past 11 years. Ontario Hydro has adopted the CANDU-PHW reactor for its large Pickering power station 20 miles from Toronto, and for Bruce power station on the shore of Lake Huron.

Hydro-Québec has called on Atomic Energy of Canada Limited and a Montreal firm of consulting engineers to carry out the preliminary design studies that will provide a first estimate. At the year-end, negotiations with these two organizations were proceeding. It is proposed to build this second unit on the east side of Gentilly powerhouse, where Hydro-Québec owns enough land for a 2,000 to 3,000-MW nuclear station. Current plans call for the future addition of a third unit.

The CANDU-PHW reactor system uses natural uranium as fuel and heavy water as both moderator and coolant, whereas the prototype reactor already in operation at Gentilly uses natural uranium as fuel, heavy water as moderator and ordinary water as coolant.

The first unit at Gentilly began to supply electricity in 1971 and reached full power in May 1972. It fed about 620 million kWh into the system during the year, until its heavy water was removed in November and sent to the Douglas Point nuclear station in Ontario, where it was urgently needed to help produce steam for the nearby Bruce heavy-water plant. Early in 1974, Gentilly will again be supplied with heavy water, enabling unit no. 1 to be put back in service. This prototype installation still belongs to AECL, but Hydro-Québec can acquire it when operation becomes continuous and dependable.

Outardes 2—At the Outardes 2 site, a 454-MW powerhouse will eventually replace the small 57-MW plant operated at Chute-aux-Outardes since 1937 by the Quebec North Shore Paper Company. When construction work was suspended in the spring of 1968, excavation of the new powerhouse site had been completed, and full heading faces had been prepared for the intake and surge tank.

In 1972, the construction program and estimates were revised, and in 1973 a decision will be made about the resumption of work.

*This rate of growth is indicated by the most recent annual revision of forecasts.

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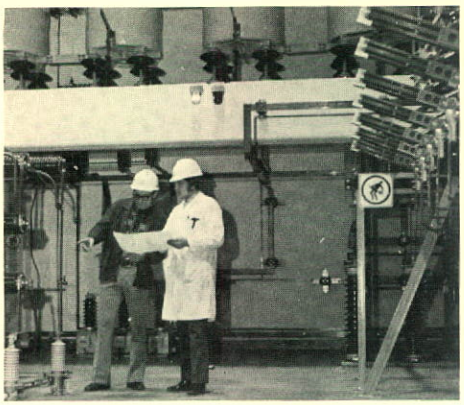

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1 High-current low-voltage section of the High Power Laboratory at the Institute of Research.

2 Installing a synchronous condenser at the Duvernay substation near Montreal.

3 A laboratory at the Institute of Research.

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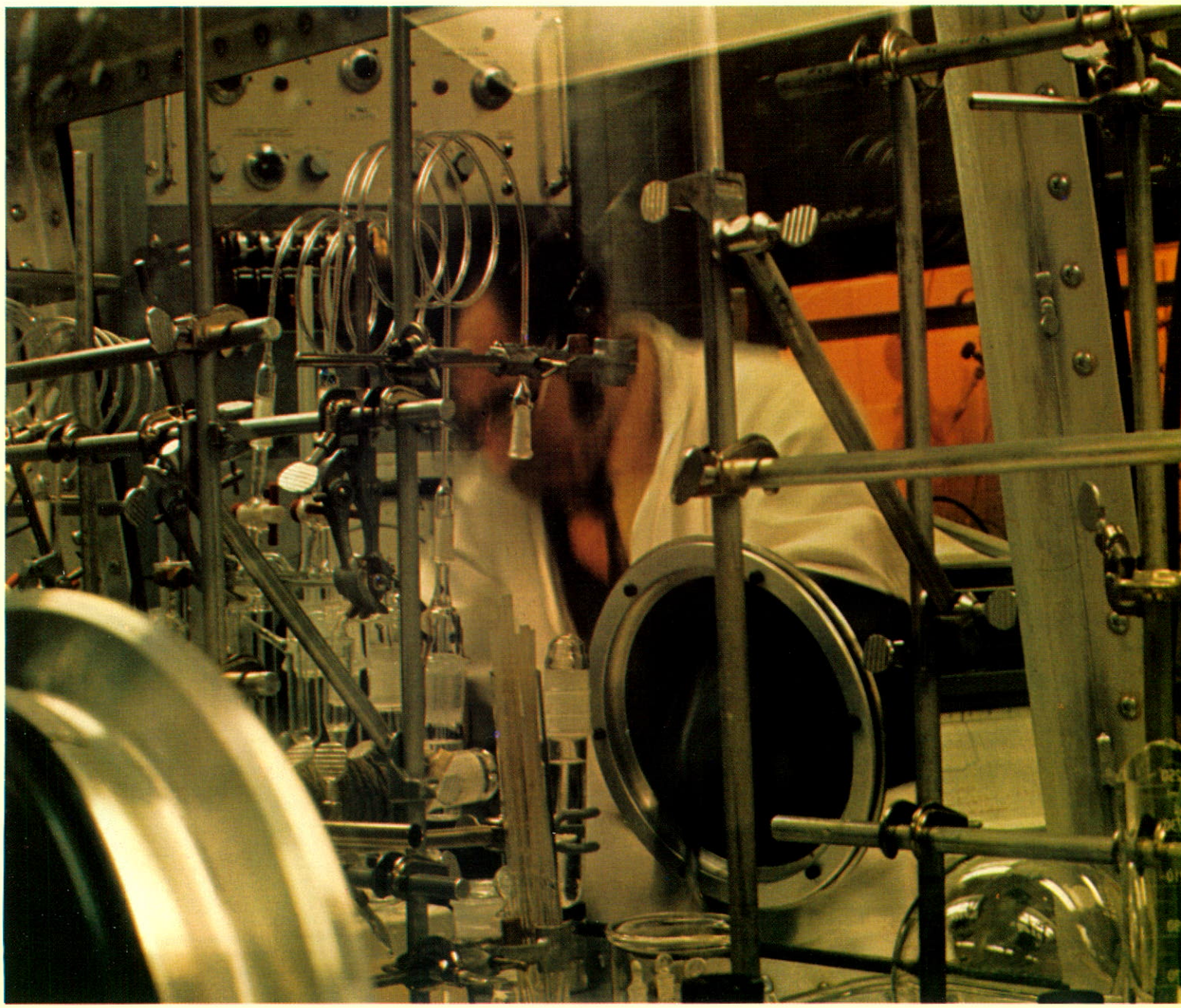


James Bay

Preliminary work—By the end of the year, work was well advanced on construction of the roads, bridges and airstrips needed to carry out the numerous civil works planned for the rivers of the La Grande complex, in the James Bay area of Québec.

A permanent road is being built north from Matagami across country dotted with lakes and marshes. By November, 176 miles of this road were passable, and by the autumn of 1973 it will be open for a distance of 380 miles, linking up with the new 67-mile-long road under construction on the left bank of the La Grande River between Fort George and the LG-2 camp site.

Airports—The new Matagami airport went into service in July. It has been provided with a tarmac 6,000 feet long and 150 feet wide. The base established on the left bank of the La Grande River across from l'Ile du Gouverneur (where the village of Fort George is located) now has a 6,000-foot landing strip and a dock for unloading equipment and supplies delivered by sea during the short navigation season.

About 30 miles from LG-2, alongside the road from Matagami, another landing strip of the same length will be opened in 1973 and will serve as the main airport of the complex.

The James Bay Development Corporation entrusted Hydro-Québec with the preparation of tender documents and the analysis of bids for all infrastructure work. During the year, 18 contracts were awarded for a total amount of $120,907,000.

The James Bay Energy Corporation is responsible for hydroelectric construction work (see Note 12 of Consolidated Financial Statements). This work will start in the autumn of 1973 with the drilling of the diversion tunnels at LG-2, where the first units of a 4,410-MW power station—the second largest in Canada after Churchill Falls—will begin operating in 1980.

Studies in Progress—Hydro-Québec's Engineering Department continued urgent studies for the Energy Corporation in 1972. These studies, and allied on-site investigations, mainly concerned LG-2 and the program to be undertaken in 1973. The Department also started validation studies concerning the proposed diversion works.

Transmission—There was heightened activity on the long and complex studies to determine the most efficient and economic method of transmitting energy from the James Bay power stations. The Hydro-Québec Institute of Research and the National Research Council were among the bodies participating in these studies which are being carried out in conjunction with similar studies in Indiana.

Calculations and tests on direct-current and 1,200 to 2,000-kV alternating-current transmission are proceeding with the aim of minimizing the number and cost of the lines and substations. Studies of proposed routes for these lines take into account all relevant social, ecological and other factors.

1 The winter road.

2 Helicopters perform valuable services.

3 La Grande River

1

2

Power Stations on the La Grande River*

	Distance from Fort George	Head	Number of units	Total capacity	Commissioning date
	(miles)	(feet)		(MW)	
LG-1	23	93	8	920	1984
LG-2	73	463	9	4,410	1980-1982
LG-3	148	265	5	1,500	1982-1983
LG-4	288	400	4	1,500	1983

*Some figures may be altered as a result of studies in progress.

Manic 3

At the Manic 3 construction site, several important phases of the project were completed during 1972, and it is expected that the six units of the 1,183-MW powerhouse will be commissioned during the period from December 1975 to October 1976. The principal structures to be built are an underground powerhouse, a 353-foot-high dam containing 11 million cubic yards of earth and rockfill, and a concrete auxiliary dam that will incorporate the intake, spillway and log-chute and also close off a side valley to the east of the main dam.

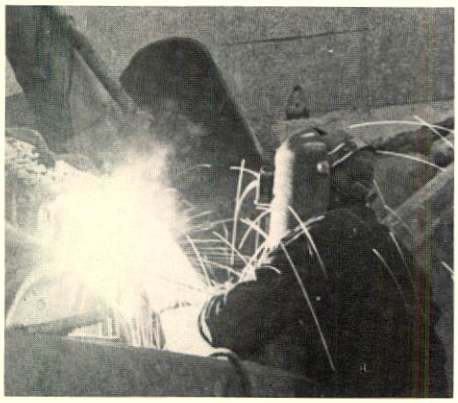
A double wall of concrete, surmounted by an inspection tunnel, has been completed under the site of the main dam. The concrete wall is designed to prevent seepage under the dam by sealing off the alluvium-filled gorge that extends 430 feet beneath the riverbed at this location. This cut-off-wall—deeper than any comparable structure built elsewhere—consists of a double row of interlocking concrete piles and panels that were poured in place. They penetrate through the alluvium and two feet into the bedrock.

To date, 1,350,000 cubic yards of material have been placed on the dam and construction will continue until 1975, when the reservoir will be impounded.

By the year-end, excavation of the penstocks, transformer hall, surge tank and tailrace tunnel had been completed, and excavation of the powerhouse cavern was nearing completion. Concreting has been started, and will continue during 1973.

At Manic 5, where the remaining units of the 1,292-MW powerhouse were commissioned in 1971, finishing work has been completed on the permanent structures. Landscaping will continue through 1973, so as to provide a pleasant setting for one of the world's most attractive dams.

The Construction Department carried out work at several other locations during 1972, and the workforce reached a peak of 2,520 during the year, including 2,035 at Manic 3.



Work under way at the Manic 3 construction site.

Transmission System

In 1972, the transmission system was augmented by more than 950 miles of lines operating at voltages ranging from 735 kV to 120 kV*. Moreover, substations supplied by this system received about 7,350 MVA** of additional transformer capacity and four more powerhouses were brought under remote control.

The second of three 735-kV lines built to transmit energy from the Churchill Falls powerhouse was put in service. It runs 265 miles from the delivery point to Micoua substation. The third line, running 255 miles from the delivery point to Manicouagan substation, should be in service by August 1973. The delivery point, where Hydro-Québec's lines connect with those built by Churchill Falls (Labrador) Corporation Limited, is located 152 miles north of Sept-Iles and 126 miles west of the powerhouse.

Another 735-kV line has been completed between the Manic-Outardes complex and the Québec City area. This 268-mile transmission line follows an inland route and connects Micoua substation to the new Jacques-Cartier substation near Québec City. In addition, the Jacques-Cartier substation was connected to the 735-kV line that links Laurentides substation (Québec City) to Duvernay substation near Montreal.

Construction is under way on the third 735-kV line to link the Manicouagan and Lévis substations. Commissioning of this 235-mile line is scheduled for October 1, 1973.

The final 61-mile section of a 260-mile double-circuit 315-kV line between Lévis and Matapédia has been completed. This line now supplies two 500 MVA transformers at Matapédia substation. Two 230-kV circuits deliver energy from this substation to New Brunswick, and other 230-kV circuits supply the new Cascapédia substation (New Richmond) and Micmac substation (Chandler), both of which are in Gaspé. These two substations are located respectively 60 and 123 miles east of Matapédia on the Baie des Chaleurs.

In Montreal, the new Aqueduc substation, built to help meet the city's increased electricity needs, has been equipped with three 408-MVA transformers, and is now supplied by a new 12-mile, 315-kV double-circuit line from Laprairie, where one circuit is connected to a line coming from Boucherville. The line from Boucherville was designed for 735-kV operation, but will function at 315 kV until 1977, when it will be extended to the new 735-kV Hertel substation planned for this area.

In the Québec City area, the new Leneuf substation near Donnacona is equipped with two 125-MVA transformers and is supplied by a 315-kV line running from Charlesbourg to Montreal.

The environment—By increasing the transmission capacity of several existing lines at low cost, we managed again this year to avoid building several additional lines, thereby protecting the environment, particularly in urban areas. This increase in capacity was achieved by retensioning conductors in certain places, so that the elongation caused by a heavier current would not produce unacceptable conductor-to-ground clearances.

Remote control and telecommunications—In 1972, the following four powerhouses were converted to remote-control operation: Outardes 4, Outardes 3 and Manic 5, operated from Manicouagan substation, and La Trenche powerhouse, operated from La Tuque. Other powerhouses already operating under remote control are Rapide 2, Rapide 7, Rapide-des-Iles, Première-Chute, Shawinigan 2, Saint-Narcisse and Manic 1. By December 31, a total of 3,574 MW of generating capacity had been brought under remote control, representing 32% of the system's installed capacity.

Chaudière was the only substation converted to remote control during the year. However, remote-control equipment is being installed in Montagnais, Arnaud, Beauharnois, Matapédia, Saint-Maxime and Mercier substations. By the year-end, the system contained 138 remotely controlled substations of all types.

The telecommunications system expands as the transmission system grows. During 1972, 1,771 circuit-miles were added to the telecommunications system, including 335 miles of microwave circuits installed principally to connect new substations to the main system and provide protection for new transmission lines. The temporary microwave link now in service between Matagami and Fort George will be replaced in 1974 by a 300-channel link for communication with the construction sites, and in 1979 by a large-capacity link for operation of the La Grande power stations.

Automation—The Hydro-Québec system is still being adapted to the advanced operating and supervisory techniques needed as transmission lines grow in number, length and capacity.

During the year, engineering design work proceeded for the new provincial control centre that will go into operation in 1975. The centre will be located in the Place Desjardins high-rise complex now under construction next to Hydro-Québec's head office in Montreal. This new provincial control centre will rely heavily on computers to program generation, control energy flows, supervise the behaviour of the main power grid, and make the best use of water storage. In addition to this provincial control centre, seven new regional control centres will be set up: Greater Montreal (also in Place Desjardins), Manicouagan, Québec City, Shawinigan, Hull, Rouyn and Rimouski.

*1 kV: 1 kilovolt: 1,000 volts
**1 MVA: 1 megavoltampere: 1,000 kilovoltamperes

Growth of Transmission System

	Number of circuit-miles added in 1972	Total length at Dec. 31, 1972
Overhead lines		
735 kV	536	2 016
345 kV		136
315 kV	165	3 098
230 kV	99	1 811
161 kV	58	872
120 kV	88	3 289
Underground cables		
120 kV ou plus	6	74
Total	**952**	**11 296**

Distribution System

Extension and strengthening of the distribution system cost $65,975,000 in 1972 which was $10,912,000 or 19.8% more than in the previous year.

Since 1963, the value (at cost) of installations used to distribute electricity within the territory has practically doubled from $464,156,000 to $915,579,000, owing to the raising of construction standards, improvements in the system, an increase in the number of customers, and greater customer demand.

During the year, $25 million was spent on system extensions and additions to supply new customers.

A total of 15.4 miles of new 44-kV and 69-kV circuits were put in service, as well as 905 miles of new circuits operating at voltages between 4 kV and 25 kV. At December 31, the distribution system comprised 43,387 miles of circuits operating at 25 kV or less, and 643 miles of 34.5-kV circuits. The system is much stronger today than it was in 1963. At that time, there were only a few miles of 25-kV circuits but an abundance of circuits operating at inadequate voltage levels. Now, one-third of the distribution system operates at 25 kV, and this proportion is increasing.

The total length of underground distribution lines rose to 1,371 miles with the placing in service of 25 miles of new underground circuits at many locations in the province. Most of these circuits supply new customers who either directly or indirectly paid for the difference between the cost of underground and overhead distribution.

In several regions, Hydro-Québec is installing a semi-underground distribution system which is pleasing to the eye and less expensive for customers than entirely underground distribution. Attractive, hollow, concrete poles without cross-bars or guy wires carry the low-voltage wires from the transformers into underground conduits leading to the houses.

The distribution system covers 55,000 square miles of territory, and in time of need the necessary personnel and equipment must be readily available at any point in the system. For this reason, the number of service centres has been increased to 52 since 1963. At December 31, a total of 1,480 men were based at these centres where they are organized into 170 service and trouble-shooting crews and 380 maintenance and construction crews. The most modern techniques and more than 400 vehicles are at their disposal, including 109 trucks equipped with lift-buckets. Most vehicles are provided with radio-telephone sets. In addition to these Hydro-Québec crews, contractors have organized 280 mobile crews comprising 750 men.

When a disastrous sleet storm struck the Laurentides region on March 22, depriving 50,000 customers of electricity, 215 of these crews converged rapidly on the area and restored service completely in less than a week. The cost of repairs was $1 million.

1

2

1 Transformer mounted on a hollow concrete pole.

2 Men at work on a live line.

Institute of Research

The first section of the High Power Laboratory of Hydro-Québec's Institute of Research was placed in service at the end of the year, and the two remaining sections will follow in 1973 and 1974. This will complete construction work at the Institute, making it North America's most comprehensive centre for electrical research and testing.

The High Voltage Laboratory, with an area of 60,000 square feet and a height of 168 feet, has been operating for a full year and now faces a busy schedule of tests on behalf of Hydro-Québec and other electric utilities, as well as electrical-equipment manufacturers.

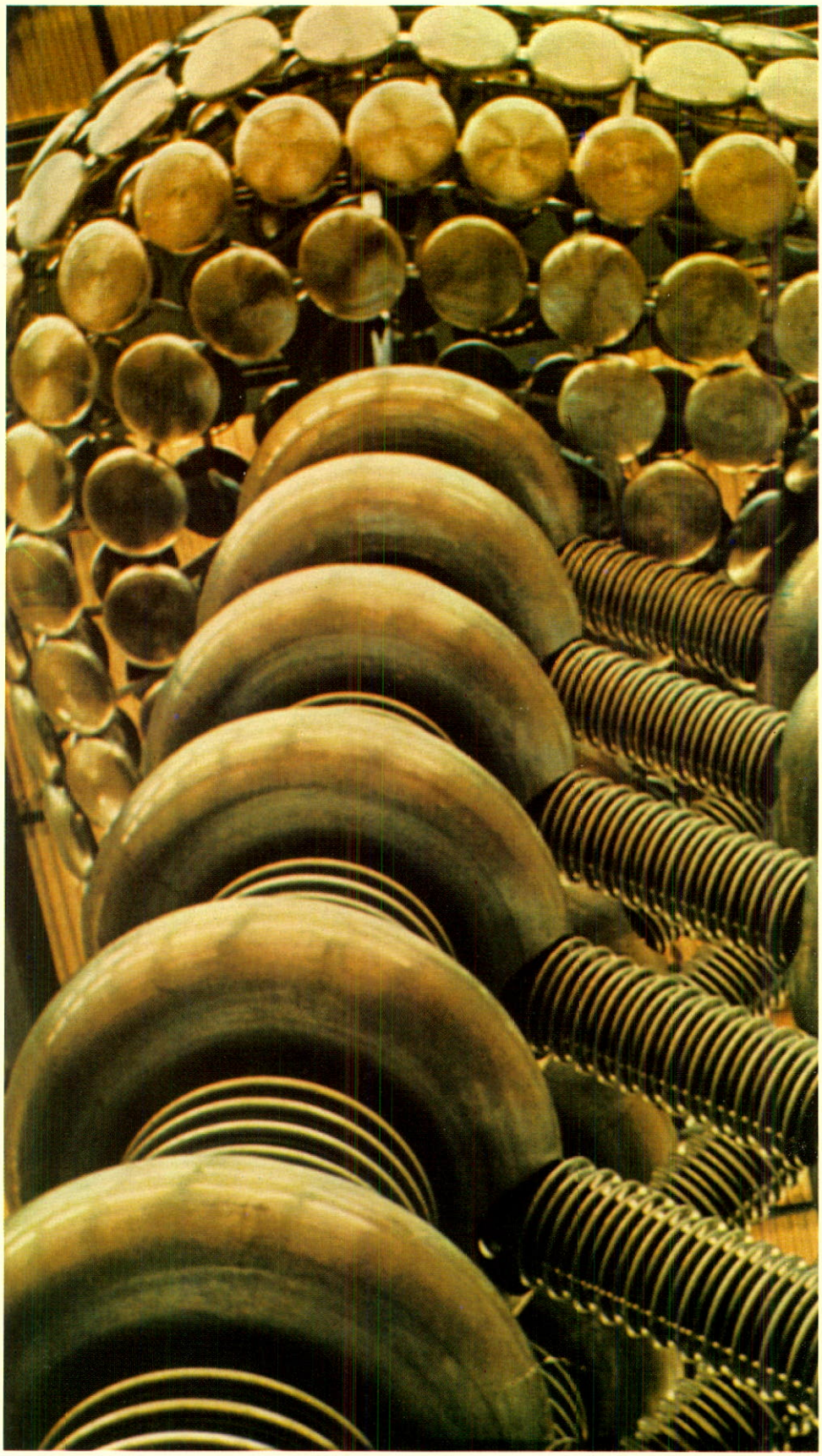
The Institute continued to collaborate with Québec and Canadian industries during 1972, and also obtained research and test contracts from customers abroad. Many other contracts are being negotiated, and the Institute was retained as consultant by government bodies and other organizations in Brazil, Spain and the U.S.

The Institute is participating in studies to determine the most economic and efficient means of transmitting electrical energy from the James Bay region to urban centres. In particular, the scientific staff is taking an active part in tests on the Magdalen Islands, where an experimental transmission line has been built to study the effects of wind-induced vibrations on bundles of 4, 6, 8 and even 10 conductors.

The Institute has also taken part in the installation and testing of six fuel-cell units at the La Canardière service centre on the outskirts of Québec City. Fuel cells could eventually replace diesel-driven generators in remote communities.

Other research programs include work on plasmas, which could one day involve the technology of thermonuclear fusion. In contrast to this, equipment is being installed for the testing of materials at cryogenic temperatures.

At December 31, the Institute's scientific, technical and administrative staff numbered 253 persons.



Personnel

Negotiations continued throughout the year with three locals of the Canadian Union of Public Employees representing more than 8,200 Hydro-Québec employees. These negotiations for the renewal of contracts that had expired on December 31, 1971 involved two work-stoppages during the year—a two-day strike in June and a nine-day one in November.

(On February 13, 1973, new collective agreements were signed with these three union locals for the period from January 1, 1972 to December 31, 1975.)

In November, negotiations got under way with the *Syndicat professionnel des ingénieurs de l'Hydro-Québec*, which represents 527 staff engineers out of a total of about 880. The engineers' contract expired on December 31, 1972. A new agreement for the period from January 1, 1972 to July 11, 1973, was concluded with the union representing 172 foremen at the Manic-Outardes construction sites.

On January 1, a new method was implemented to increase the pensions of certain categories of retired employees by using funds from the operating budget without altering the pension plans or increasing employee contributions. Under this formula, 2,017 pensioners received additional payments of $1,525,000 during 1972.

During the year, 69 pensioners died; 126 permanent employees retired, 36 died, and 292 left for various reasons.

At December 31, there were 12,627 permanent employees, 382 more than the previous year. These figures do not include employees at construction sites. Wages and salaries paid during the year (not counting fringe benefits) rose to $144,283,000 compared with $129,673,000 in 1971.

The number of employees at construction sites dropped during the year to an average of 1,689, compared with 2,104 in 1971, and salaries amounted to $21,033,000 as against $24,840,000 the previous year.

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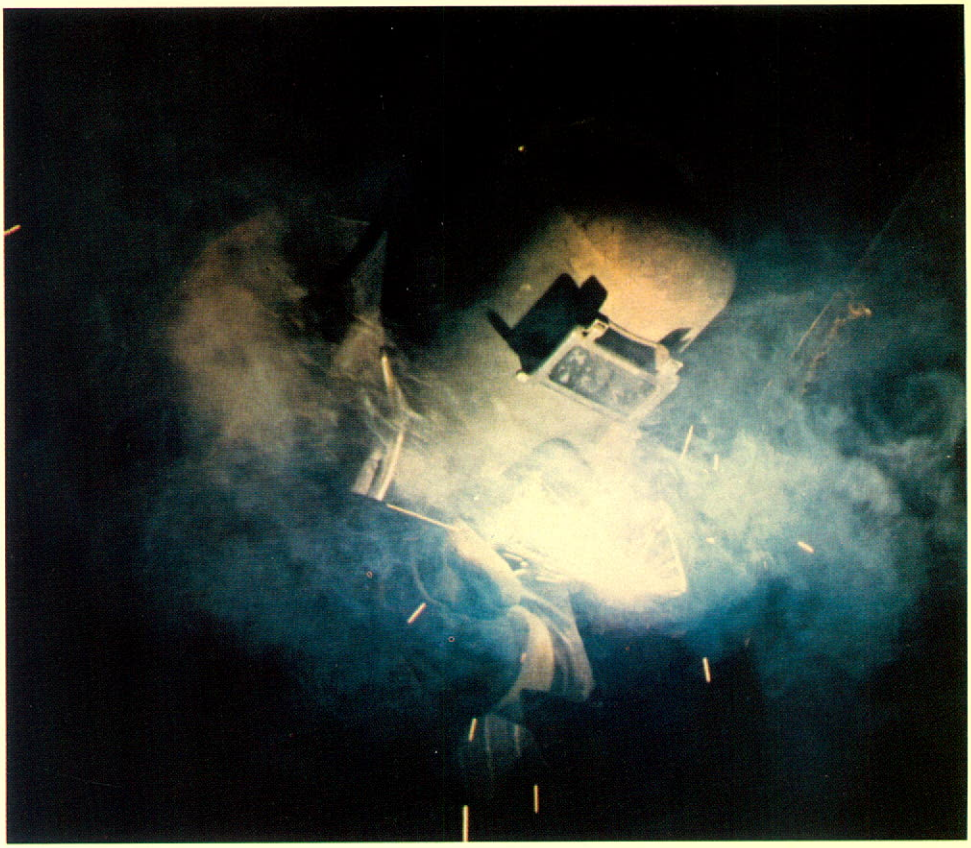

2

1 Welder at work

2 **Customer Service**
Hydro-Québec customers who have business to transact or who require information are now being directed to specialists in the newly formed Customer Service. The staff has been specially trained to handle customer complaints and to represent customers' interests within the enterprise.

Hydro-Québec Annual Report 1972

Financial and Statistical Statements

Auditors' Report

We have examined the consolidated balance sheet of the Quebec Hydro-Electric Commission and its subsidiaries as at December 31, 1972, and the consolidated statements of revenue and expenditure, reserves, and source and application of funds for the year then ended. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion, the operations of the Commission during the year have been carried on in conformity with the Hydro-Quebec Act and these consolidated financial statements, forming the report of the Commission, present fairly the financial position of the Commission and its subsidiaries as at December 31, 1972, and the results of their operations and the source and application of their funds for the year then ended, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Montreal, Canada,
March 9, 1973.

H. Marcel Caron, C.A.
of Clarkson, Gordon & Co.
Chartered Accountants

Samson, Bélair, Côté, Lacroix
et Associés
Chartered Accountants

Consolidated Statement of Revenue and Expenditure

(in thousands of dollars)
for the year ended December 31

		1972	1971
Revenue	Sales of electricity (note 2)	$561,145	$518,314
	Increase in unbilled revenue	7,449	5,963
		568,594	524,277
	Other operating income (net)	11,554	11,282
		580,148	535,559
Expenditure	Operating, maintenance, administration and other expenses	172,300	149,897
	Provision for renewals (depreciation) (note 10)	70,030	64,103
	Provincial levy on energy generated	29,882	29,057
	School and municipal taxes	18,875	19,070
	Power purchased (note 4)	34,446	15,738
		325,533	277,865
Net operating income		**254,615**	257,694
Other income	Investment income (net)	10,573	10,094
	Net profit on repurchase of debentures (note 6)	7,561	9,547
Income before interest charges		**272,749**	277,335
Interest charges	Interest on long-term debt	191,511	167,800
	Interest on bank indebtedness and notes payable	4,636	8,007
	Amortization of debenture discount and expenses	3,524	3,311
	Interest charged to construction work in progress	(25,825)	(29,535)
		173,846	149,583
Net income before interest on reserves		**98,903**	127,752
	Interest on reserves (note 9)	68,487	57,250
Available for reserves		**$ 30,416**	$ 70,502
Provision for reserves (note 9)	Contingencies	—	$ 36,203
	Stabilization of rates	$ 4,653	10,485
	Amortization of capital invested	25,763	23,814
		$ 30,416	$ 70,502

See accompanying notes

Consolidated Balance Sheet (note 1)

(in thousands of dollars)
as at December 31

	Assets	1972	1971
Fixed assets	Property and plant, at cost:		
	In service	$4,598,781	$4,250,783
	Less reserve for renewals (accumulated depreciation) (note 10)	877,832	815,420
		3,720,949	3,435,363
	Construction work in progress	465,021	411,304
		4,185,970	3,846,667
	Construction, operating and sundry equipment, at cost less accumulated depreciation	28,884	23,542
		4,214,854	3,870,209
Current assets	Cash and short-term investments, at cost	39,201	34,543
	Accounts receivable (note 2)	80,126	59,361
	Unbilled revenue	49,876	42,427
	Materials and supplies, at cost	30,748	27,714
	Prepaid expenses	4,730	5,454
		204,681	169,499
Other assets	Investments, at cost (note 3)	132,135	132,190
	Unamortized debenture discount and expenses	53,147	50,442
	Accounts receivable	9,133	10,040
	Unamortized deferred cost on purchase of energy (note 4)	26,421	16,658
		220,836	209,330
		$4,640,371	$4,249,038

	Liabilities and Reserves	1972	1971
Long-term debt	Bonds and debentures—guaranteed by the Province of Quebec (notes 5 and 7)	$3,172,013	$2,875,894
	Less sinking funds (notes 5 and 6)	51,254	53,825
		3,120,759	2,822,069
	Net exchange premium (note 7)	80,773	81,364
		3,201,532	2,903,433
	Other long-term debt (note 8)	27,217	24,832
		3,228,749	2,928,265
Notes payable	Notes payable within one year	**70,067**	98,045
Current liabilities	Bank indebtedness	19,344	21,959
	Accounts payable and accrued liabilities	110,860	94,851
	Accrued interest	60,785	54,110
		190,989	170,920
Other liabilities	Workmen's compensation awards	2,523	2,431
	Customers' deposits and advances	8,307	8,544
		10,830	10,975
Reserves (note 9)	Contingencies	454,300	426,252
	Stabilization of rates	203,419	186,495
	Amortization of capital invested	482,017	428,086
		1,139,736	1,040,833
		$4,640,371	$4,249,038

On behalf of the Commission:
(signed) Roland Giroux
(signed) Paul Dozois

Montreal, March 9, 1973

(signed) E.-A. Lemieux,
General Manager,
Finance and Accounting.

See accompanying notes

Consolidated Statement of Reserves

(in thousands of dollars)
for the year ended December 31

	1972				1971
	Contingencies	Stabilization of rates	Amortization of capital invested	Total	Total
Balance, January 1	$426,252	$186,495	$428,086	$1,040,833	$ 913,081
Add:					
Interest on reserves (note 9)	28,048	12,271	28,168	68,487	57,250
Provisions from consolidated revenue	—	4,653	25,763	30,416	70,502
Balance, December 31	**$454,300**	**$203,419**	**$482,017**	**$1,139,736**	$1,040,833

See accompanying notes

QUEBEC HYDRO-ELECTRIC COMMISSION AND ITS SUBSIDIARIES

Consolidated Statement of Source and Application of Funds

(in thousands of dollars)
for the year ended December 31

	1972	1971
Source of funds		
Operations		
Net income before interest on reserves	$ 98,903	$127,752
Less net profit on repurchase of debentures	7,561	9,547
	91,342	118,205
Plus:		
Provision for renewals (depreciation)	70,030	64,103
Depreciation of operating equipment	5,001	4,131
Amortization of debenture discount and expenses	3,524	3,311
Amortization of deferred cost on purchase of energy	1,783	—
	171,680	189,750
Issue of debentures (less discount and expenses)	374,809	334,640
Sundry items (net)	5,884	10,297
	$552,373	$534,687
Application of funds		
Additions to fixed assets (cost)	$423,823	$388,592
Less depreciation of construction equipment	223	3,032
	423,600	385,560
Maturities of long-term debt	33,591	46,424
Purchase of sinking fund investments (cost)	39,954	34,889
Decrease in notes payable	27,978	30,813
Increase in deferred cost on purchase of energy	11,546	9,290
Net exchange premium	591	769
Increase in working capital	15,113	26,942
	$552,373	$534,687

See accompanying notes

Notes to Consolidated Financial Statements

December 31, 1972

Principles of consolidation

Note 1

The consolidated financial statements include the financial statements of the Commission and those of all its subsidiary companies including, since January 1, 1972, the James Bay Energy Corporation.

Accounts receivable and sales of electricity

Note 2

The accounts receivable at December 31, 1972 and sales of electricity for 1972 include $7,400,000 of 1972 billings issued in 1973 as a result of the employees' strike.

Investments, at cost

Note 3

	1972 ($'000')	1971 ($'000')
Churchill Falls (Labrador) Corporation Limited (see note 12)		
General Mortgage Bonds, 7½%, due 2010 (par value $100 million)	$ 90,500	$ 90,500
Common shares:		
Fully paid	34,333	34,333
	124,833	124,833
Gelco Enterprises Ltd., 4% unsecured note, due 1991	7,195	7,250
Sundry investments	107	107
	$132,135	$132,190

Unamortized deferred cost on purchase of energy

Note 4

In accordance with the terms of a contract with Churchill Falls (Labrador) Corporation Limited (see note 12), the Commission is obligated to pay to the Corporation an amount equal to a part of the interest charges on the First Mortgage Bonds, General Mortgage Bonds and other indebtedness of the Corporation. Beginning in 1972, these payments are amortized over the life of the contract by charges to the cost of power purchased.

Bonds and Debentures

Note 5

Series	Interest Rate	Year of Issue	Year of Maturity	Bonds and Debentures ($'000')	Sinking Fund Investments ($'000') (Note 6)
Quebec Hydro-Electric Commission					
"D"	3%	1947	1973	$ 16,300	
*"K"	3½%	1953	1978	37,170 U.S.	$ 13,489
*"L"	3¼%	1954	1974	20,594	725
*"M"	3½%	1955	1975	26,973	610
*"N"	3½%	1956	1981	35,732 U.S.	11,444
*"O"	4¼%	1956	1976	17,908	100
*"P"	4¼%	1956	1981	26,164 U.S.	6,677
*"Q"	4¾%	1957	1977	33,343 U.S.	1,703
*"S"	5%	1957	1975, 1982	21,230	
*"T"	3¾%	1958	1983	37,176 U.S.	6,583
*"V"	5%	1958	1979	15,809	181
*"W"	5%	1959	1980	22,619	
*"X"	5%	1959	1984	36,307 U.S.	
*"Y"	6%	1959	1979	19,696	
*"Z"	5½%	1960	1982	$ 27,149	
*"AA"	5½%	1960	1983	20,442	
*"AB"	5½%	1961	1985	33,374	$ 485
*"AC"	5½%	1961	1985	30,608	860
*"AD"	5½%	1962	1982	34,296	92
*"AF"	5¾%	1962	1984	44,137	
*"AG"	5%	1963	1988	259,288 U.S.	
"AH"	4%	1963	1973	20,000	
"AI"	4½%	1963	1973	7,118	
"AJ"	5%	1963	1973	12,196	
"AK"	5½%	1963	1973	5,775	

Note 5—Bonds and Debentures (cont'd)

Series	Interest Rate	Year of Issue	Year of Maturity	Bonds and Debentures ($'000')	Sinking Fund Investments ($'000') (Note 6)
"AL"	6%	1963	1973	8,089	
*"AM"	5¼%	1963	1986	43,031	665
*"AN"	5½%, 5½%	1964	1984, 1994	34,973	
*"AO"	4½%	1964	1994	50,000 U.S.	7,339
*"AP"	4¾%	1964	1989	42,225 U.S.	
*"AQ"	5½%	1964	1988	52,667	
*"AR"	5½%, 5%	1965	1987, 1995	65,534	
*"AS"	4⅝%	1965	1985	47,697 U.S.	
*"AT"	5¼%	1966	1987	47,350 U.S.	
*"AU"	6%	1966	1991	46,397	
*"AV"	5⅜%	1966	1992	58,400 U.S.	
*"AW"	6%	1966	1980, 1990	45,863	36
*"AX"	6¼%	1966	1991	38,975 U.S.	
*"AY"	6¼%	1967	1993	58,500 U.S.	
*"AZ"	6½%	1967	1978, 1990	47,437	265
*"BA"	6¼%	1967	1993	50,000 U.S.	
*"BB"	6½%	1967	1992	50,000 U.S.	
*"BC"	6¾%, 7%, 6% and 7%	1967	1973-1977, 1980, 1994	52,500	
*"BD"	6⅞%	1968	1989	60,000 U.S.	
*"BE"	7½%, 7½%, 7%	1968	1973-1978, 1980, 1994	45,200	
*"BF"	7¾%	1968	1986	25,000 U.S.	
*"BG"	7¼%	1968	1991	50,000 U.S.	
"VA"	7¼%	1968	1974	10,000 U.S.	
* —	6¾%	1969	1984 (150 million Deutsche Marks)	40,216	
* —	7¼%	1969	1984 (100 million Deutsche Marks)	27,045	
*"BH"	7¾%	1969	1974 (1990 at the option of the holders)	50,000	
*"BI"	8¾%	1969	1999	50,000 U.S.	
"BJ"	8%	1969	1979 (1974 at the option of the holders)	20,000 U.S.	
*"BK"	8½%	1969	1992	25,812	
*"BL"	9¾%	1969	1995	50,000 U.S.	
*"BM"	9½%	1970	1975 (1990 at the option of the holders)	50,000	
*"BN"	9¼%	1970	1995	60,000 U.S.	
*"BO"	9½%	1970	1990	29,460	
*"BP"	9½%	1970	1997	75,000 U.S.	
*"BQ"	9¼%	1970	1985	13,800 U.S.	
*"BR"	8¾%	1971	1999	75,000 U.S.	
*"BS"	8¼%	1971	1986	19,200 U.S.	
*"BT"	7¾%	1971	1996	49,480	
*"BU"	8¾%	1971	1996	49,520	
* —	8%	1971	1986 (100 million Deutsche Marks)	29,835	
*"BV"	8½%	1971	2001	75,000 U.S.	
*"BW"	8½%	1971	1986	25,000 U.S.	
*"BX"	7⅞%	1972	2002	100,000 U.S.	
* —	6½%	1972	1987 (100 million Deutsche Marks)	31,391	
*"BY"	8¼%	1972	1997	50,000	
*"BZ"	8¼%	1972	1993	60,000	
*"CA"	8⅜%	1972	1997	65,000	
"CB"	8¼%	1972	1996	50,000	
* —	6¼%	1972	1987 (80 million Swiss Francs)	21,021	
				$3,083,022	**$ 51,254**

*Sinking fund debentures

Note 5—Bonds and debentures (cont'd)

Series	Interest Rate	Year of Issue	Year of Maturity	Bonds and Debentures ($'000')	Sinking Fund Investments ($'000') (Note 6)
The Shawinigan Water and Power Company					
First Mortgage Sinking Fund Bonds					
"P"	3½%	1948	1973	$ 19,369	
"Q"	3%	1950	1975	14,650 U.S.	
"R"	4¾%	1956	1976	10,110	
"S"	5¾%	1961	1981	14,219	
				$ 58,348	
Southern Canada Power Company, Limited					
First Mortgage Bonds					
"B"	3½%	1946	1976	$ 5,330	
"C"	3½%	1948	1976	2,400	
"D"	3⅜%	1951	1981	2,500	
				$ 10,230	
Quebec Power Company					
First Mortgage Sinking Fund Bonds					
"G"	6¼%	1962	1982	**$ 12,012**	
Gatineau Power Company					
First Mortgage Bonds					
"E"	3¾%	1948	1973	**$ 2,046**	
Lower St. Lawrence Power Company					
First Mortgage Sinking Fund Bonds					
"E"	4½%	1953	1973	$ 683 U.S.	
"F"	5⅞%	1959	1984	880 U.S.	
				$ 1,563	
Northern Quebec Power Company, Limited					
First Mortgage Sinking Fund Bonds					
"B"	5⅛%	1954	1974	**$ 162**	

Note 5—Bonds and Debentures (cont'd)

Series	Interest Rate	Year of Issue	Year of Maturity	Bonds and Debentures ($'000')	Sinking Fund Investments ($'000') (Note 6)
Saguenay Electric Company					
First Mortgage Sinking Fund Bonds					
"C"	4⅞%	1953	1973	$ 930	
General Mortgage Sinking Fund Bonds					
"A"	5½%	1962	1982	3,700	
				$ 4,630	
Total Bonds and Debentures				**$3,172,013**	**$ 51,254**

The Commission issued on January 4, 1973, $125,000,000 (U.S.) of 7½% Debentures, Series "CC", dated January 1, 1973 and maturing January 1, 2003; on February 21, 1973, $50,000,000 of 8% Debentures, Series "CD", dated February 21, 1973 and maturing February 21, 1998 and on March 8, 1973, 100 million Deutsche Marks of 6½% Debentures dated March 1, 1973 and maturing March 1, 1988.

Bonds and debentures of subsidiary companies are guaranteed by the Commission, which guarantee is in turn guaranteed by the Province of Quebec.

Consolidated long-term debt maturities and sinking fund requirements in each of the next five years are approximately as follows:

	Maximum maturities and requirements ($'000')	Maturities at the option of the holders ($'000')	Minimum maturities and requirements ($'000')
1973	$143,027		$143,027
1974	150,909	$70,000	80,909
1975	154,271	50,000	104,271
1976	95,554		95,554
1977	97,083		97,083

Note 6

Sinking Funds

The Commission invests substantially all of its sinking funds in its own debentures and in those of its subsidiaries and follows the practice of carrying these investments at par, which may not be indicative of cost or current market value. The resulting profit, net of unamortized debenture discount and other expenses, is credited to revenue and expenditure. Debentures of an issue purchased for the sinking fund of that issue have been cancelled.

Note 7

Net Exchange Premium

Consolidated long-term debt includes $1,593,996,000 payable in U.S. currency which is carried in the accounts at the rate of $1 U.S. equals $1 Canadian and 450 million Deutsche Marks and 80 million Swiss Francs carried in the accounts at the Canadian dollar equivalent at the dates of borrowing. The net exchange premium shown on the consolidated balance sheet represents the adjustment arising from the conversion of debt payable in U.S. funds into Canadian funds at the rates of exchange in effect at the time the debt was incurred or included in consolidation, less the premium on debentures purchased for sinking funds.

If the net debt payable in foreign currencies was converted into Canadian dollars at the rates of exchange prevailing at December 31, 1972, the premium required would be approximately $76,700,000 less than the net exchange premium shown on the consolidated balance sheet.

Notes to Consolidated Financial Statements
December 31, 1972

Note 8

Other Long-Term Debt

	1972 ($'000')	1971 ($'000')
Rural Electrification Bureau, 1973-1993*	$ 8,427	$ 9,127
Government of Canada**	17,584	14,111
Other long-term debt maturing from 1973 to 1992	1,206	1,594
	$ 27,217	$ 24,832

*Does not bear interest as long as there is no default under the provisions of the governing agreements.
**Guaranteed by the Province of Quebec, 7 3/16%—7½%—7 11/16% notes payable in 25 equal annual instalments of principal and interest starting not later than March 31, 1975.

Note 9

Reserves

The Hydro-Quebec Act requires the Commission to create reserves for contingencies, stabilization of rates and amortization of the capital invested. In addition to the amounts provided for the respective reserves at the end of each year, the Commission, as required by the Act, charged to revenue and expenditure and credited to reserves interest on the amounts of the reserves at the average cost of money to the Commission in the year as follows: 1972—6.58%; 1971—6.27%.

Note 10

Provision for renewals (depreciation)

The Commission uses a uniform sinking fund method of providing for depreciation of its own and its subsidiaries' property and plant based on their respective service lives.

The expected service lives for the main categories of property and plant in service are as follows:

Class	Life
Hydraulic power houses	50 years
Hydraulic turbines and generators	40 years
Dams and reservoirs	50 years
Transmission towers (steel) and conductors	50 years
Distribution poles (wood)	25 years
Distribution conductors	40 years

Note 11

Pensions

The Hydro-Quebec employees' retirement plan is a contributory, benefit-based plan, under which the benefits payable are guaranteed by the Commission, and applies to all Hydro-Quebec employees including those who were employees of the subsidiaries prior to January 1, 1966 and who are therefore covered by the pension funds of the subsidiaries for service prior to that date. The initial actuarial deficit, in respect of services prior to 1966, amounting to approximately $30 million at December 31, 1971 and an experience deficiency for current services for the years 1969 to 1971 of approximately $11 million, were determined by an actuarial survey of the plans at that date.

At December 31, 1972 the Commission had provided in its accounts an amount of $6,319,000 for the amortization of the above deficits and will pay this amount to the Retirement Fund in 1973. In addition, the Commission will assume the annual amortization ($2,107,000) of the initial actuarial deficit over a period ending December 31, 1995.

The total pension cost of $13,422,000 for 1972 ($11,849,000 for 1971) provides fully for the Commission's contributions to the Quebec Pension Plan and to the Retirement Fund in respect of current services, interest on the actuarial deficit in respect of past services and amortization of this deficit over a period ending December 31, 1995.

Furthermore, effective January 1, 1972, the Commission decided to pay supplementary amounts in order to assure a minimum pension of $1,200 per year and to adjust the pensions paid or to be paid to the pensioners of the subsidiaries acquired in 1963. The past service liability related to these benefits and not provided for in the consolidated financial statements amounted to approximately $32 million at December 31, 1971 according to an actuarial study at that date. This amount will be substantially amortized over a period of thirty years by annual charges to operations as the benefits are disbursed. The Commission paid $1,525,000 in respect of these benefits in 1972.

Note 12

Churchill Falls

Commitments

In May 1969, the Commission executed a contract for the purchase, starting in 1972, of a very large amount of energy from a generating station at Churchill Falls in Labrador with a rated capacity of 5,225,000 kilowatts, in process of construction by Churchill Falls (Labrador) Corporation Limited ("CFLCo"). CFLCo has entered into long-term and interim financing contracts which, with internally generated funds, will, in its opinion, permit it to cover the cost of the project estimated originally at $950 million and now at $937 million. The Commission holds 34.2% of the common stock of CFLCo and $100 million of its General Mortgage Bonds at a total cost of approximately $124.8 million. If CFLCo is not able to obtain otherwise any further funds which may be necessary to complete the project, it can call upon the Commission to purchase units of Subordinated Debentures and shares of Common Stock.

The power contract provides for the purchase by the Commission for a period of 40 years from the completion of the project, scheduled for 1976, of all the power generated at Churchill Falls except for amounts required (not exceeding 12% of the energy generated) by Newfoundland. This contract will be automatically renewed for a further period of 25 years, upon already agreed terms. The price to be paid by the Commission for the energy will vary until the year 2016 and will depend upon the final cost of construction of the plant. It is estimated that the maximum total annual payments by the Commission for energy will range from $93 million to $80 million until the year 2016 and will be approximately $63 million during the remaining 25 years. In addition, the Commission is obligated to pay CFLCo an amount equal to a part of the interest charges on the First Mortgage Bonds, General Mortgage Bonds and other indebtedness of CFLCo. The Commission estimates that these payments will not exceed $15 million per annum, declining as the Bonds and other indebtedness are retired. Subject to certain limitations and compensations, the contract requires the Commission to make payments for energy whether or not taken; the Commission can also be required to make additional advances, against the issue of units of Subordinated Debentures and shares of Common Stock, to service the debt of CFLCo and to cover its expenses if funds are not otherwise available.

Commercial delivery of power from the first two generating units, of a total of eleven units, began early in December 1971 and units three and four began in June and July 1972, respectively. The Commission took delivery of about 6,300,000,000 kilowatt-hours during 1972 at a cost of approximately $14 million.

Having temporary surpluses of power, the Commission has signed contracts with the Hydro-Electric Power Commission of Ontario and the New Brunswick Electric Power Commission for the sale to them of substantial amounts of power until 1977.

James Bay

In July 1971, the Quebec Government created the James Bay Development Corporation to undertake the development of the natural resources in northwestern Quebec and in December 1971, the James Bay Energy Corporation was created to develop the hydroelectric resources of the same area. The act incorporating the company provides for the majority of the shares of James Bay Energy Corporation to be subscribed for by the Quebec Hydro-Electric Commission. In February 1972, the directors of the James Bay Energy Corporation accepted from the Commission a subscription for 7,000,000 shares of capital stock, out of a total authorized capital of 10,000,000 shares, for a price of $700,000,000 payable over a period of ten years. This subscription calls for payments of $50,000,000 in each of the years 1972 and 1973.

Of the 500,005 shares of the James Bay Energy Corporation outstanding at December 31, 1972, 499,998 are owned by the Commission, 5 by members of the Commission, 1 by a director of the James Bay Energy Corporation and 1 by the James Bay Development Corporation.

In 1972, a decision was taken to start the James Bay project with the construction of four generating plants, with a projected installed capacity of 8,300,000 kilowatts, on the La Grande River at a currently estimated cost of $5.8 billion. Completion of this initial stage is expected in 1984.

With the exception of the subscription for shares mentioned above, the extent of the financial involvement of the Commission in connection with the project cannot yet be determined.

Other commitments

Commitments in respect of construction contracts and for the purchase of equipment amounted to approximately $296 million at December 31, 1972, including $136 million for James Bay Energy Corporation.

Note 13

Litigation

In May 1972, certain Indian chiefs and Eskimos took action in the Superior Court for the District of Montreal to have the James Bay Region Development Act declared unconstitutional and ultra vires of the jurisdiction of the legislature of Quebec and, in addition, to obtain a permanent order of injunction to prevent proceedings against the carrying out of all works in the James Bay territory related to this act.

In November 1972, procedures for an interlocutory injunction were instituted to stop the carrying out of these works until a final judgment is obtained on the principal injunction. Hearings regarding these latter proceedings commenced in December 1972 and are continuing.

Summary of Consolidated Revenue and Expenditure

(in thousands of dollars)

		1972	1971	1970	1969	1968
Revenue	Sales of electricity (1)	$561,145	$518,314	$478,246	$416,012	$386,942
	Increase in unbilled revenue	7,449	5,963	4,820	4,315	3,049
		568,594	524,277	483,066	420,327	389,991
	Other operating income (net)	11,554	11,282	11,253	10,781	7,837
		580,148	535,559	494,319	431,108	397,828
Expenditure	Operating, maintenance, administration and other expenses (2)	172,300	149,897	144,344	143,704	130,050
	Provision for renewals (depreciation)	70,030	64,103	58,805	51,488	45,751
	Provincial levy on energy generated	29,882	29,057	27,784	23,744	22,088
	School and municipal taxes	18,875	19,070	18,182	18,091	17,999
	Power purchased (3)	34,446	15,738	15,647	17,536	18,750
		325,533	277,865	264,762	254,563	234,638
Net operating income		**254,615**	257,694	229,557	176,545	163,190
Other income	Investment income (net)	10,573	10,094	10,564	9,114	3,470
	Net profit on repurchase of debentures	7,561	9,547	8,796	6,736	3,738
	Profit on disposal of common shares of British Newfoundland Corporation Ltd.					1,092
Income before interest charges		**272,749**	277,335	248,917	192,395	171,490
Interest charges	Interest on long-term debt	191,511	167,800	148,443	130,654	117,023
	Interest on bank indebtedness and notes payable	4,636	8,007	12,721	17,962	12,761
	Amortization of debenture discount and expenses	3,524	3,311	3,190	2,899	2,526
	Interest charged to construction work in progress	(25,825)	(29,535)	(32,079)	(43,885)	(38,559)
		173,846	149,583	132,275	107,630	93,751
Net income before interest on reserves		**98,903**	127,752	116,642	84,765	77,739
	Interest on reserves	68,487	57,250	46,910	39,284	33,852
Available for reserves		**$ 30,416**	$ 70,502	$ 69,732	$ 45,481	$ 43,887
Provisions for reserves	Contingencies	—	$ 36,203	$ 38,227	$ 18,002	$ 19,328
	Stabilization of rates	**$ 4,653**	10,485	9,661	8,407	7,800
	Amortization of capital invested	25,763	$ 23,814	$ 21,844	$ 19,072	16,759
		$ 30,416	$ 70,502	$ 69,732	$ 45,481	$ 43,887

(1) 1972 includes $7,400 of 1972 billings issued in 1973 as a result of the employees' strike.
(2) Including fuel $848—1972; $1,669—1971; $3,827—1970; $12,641—1969; $11,399—1968.
(3) 1972 includes $1,783 of amortization of deferred cost on purchase of energy.

Five-Year Consolidated Sales and Revenue

		1972	1971	1970	1969	1968
Electric Energy Generated & Purchased (in millions of kWh)	Generated (net)	55,660	54,134	52,165	46,760	43,068
	Purchased	11,560	4,200	4,001	4,298	4,660
		67,220	58,334	56,166	51,058	47,728
	Losses and internal use	5,272	4,640	4,422	3,829	3,830
	Delivered as per agreement (net)	665	625	858	458	582
	Increase in unbilled sales	887	570	274	458	246
	Total electric energy sold	**60,396**	52,499	50,612	46,313	43,070
Electric Sales (in millions of kWh)	Domestic and farm	13,703	12,503	11,696	10,883	10,125
	Commercial (including Municipal)	10,629	9,096	6,684	5,505	4,367
	Industrial: Primary	22,766	22,369	24,032	23,334	22,174
	Secondary	1,573	439	574	819	640
	Street lighting and luminaires	457	453	429	413	402
	Transportation	164	164	161	164	176
	Wholesale: Primary	9,194	5,008	3,784	3,710	3,802
	Secondary	1,848	2,395	2,569	826	642
	Interdepartmental	62	72	683	659	742
	Total electric sales	**60,396**	52,499	50,612	46,313	43,070
Sales Revenue (in thousands of dollars)	Domestic and farm	$203,038	$189,293	$174,231	$148,661	$139,670
	Commercial (including Municipal)	152,299	134,539	103,303	83,912	70,816
	Industrial: Primary	147,949	144,903	159,122	150,602	144,999
	Secondary	3,655	1,665	2,115	2,957	2,228
	Street lighting and luminaires	13,437	12,720	11,586	10,346	9,629
	Transportation	1,371	1,402	1,306	1,318	1,363
	Wholesale: Primary	34,469	20,046	14,921	14,383	14,714
	Secondary	4,722	13,510	9,588	1,844	1,285
	Interdepartmental	205	236	2,074	1,989	2,238
	Total sales revenue	**$561,145**	$518,314	$478,246	$416,012	$386,942
Total Customer Accounts	(year-end)	**1,943,119**	1,895,082	1,852,292	1,772,878	1,719,799
Domestic and Farm Accounts	(year-end)	**1,716,529**	1,669,523	1,632,393	1,568,689	1,525,380

Note: 1972 includes 480 million kWh and $7,400 of 1972 billings issued in 1973 as a result of the employees' strike.

Statistics of Electricity Generated and Purchased and its Disposal in 1972

Gross Generation		The consolidated system (in millions of kWh)	
Hydro-Electric Stations			
Upper Ottawa	(5 plants)		2,326
Gatineau	Paugan	1,091	
	Others (3 plants)	1,292	2,383
Lower Ottawa	Carillon	2,887	
	Others (9 plants)	959	3,846
Upper Saint Lawrence	Beauharnois	11,724	
	Other (1 plant)	944	12,668
Saint Maurice	La Trenche	1,476	
	Beaumont	1,372	
	La Tuque	1,258	
	Shawinigan 3	1,039	
	Others (4 plants)	3,738	8,883
Bersimis	Bersimis 1	4,643	
	Bersimis 2	2,385	7,028
Outardes	Outardes 3	4,022	
	Outardes 4	3,098	7,120
Manicouagan	Manic 5	5,646	
	Manic 2	4,310	
	Others (2 plants until the end of September 1972 and one plant thereafter)	793	10,749
Other rivers	(14 plants)		669
Total	(51 hydro-electric stations, then 50)		55,672
Thermal-Electric Stations	Tracy	171	
	Others (16 plants until the end of October 1972 and 15 plants thereafter)	63	234
Total gross generation	(68 plants, then 66)		55,906
Less: station use			246
Total generation (net)			55,660
Purchased from	Alcan		3,103
	Maclaren-Quebec Power Co.		903
	Atomic Energy of Canada (Gentilly)		622
	Churchill Falls (Labrador) Corporation		6,324
	Sundry Purchases		608
Total			11,560
Less: delivered as per agreement (net)			665
Energy supplied			10,895
Net system total output			66,555
Total sales			60,396
Increase in unbilled sales			887
Losses			5,272
System Peaks (MW)	Primary		10,423
	Secondary		225
	Foreign network support		44

Hydro-Quebec Employees's Retirement Fund

Auditors' Report

We have examined the statement of assets and reserve of the Hydro-Quebec Employees' Retirement Fund as at December 31, 1972 and the statement of revenue and expenditure for the year ended on that date. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the assets of the Fund as at December 31, 1972 and its revenue and expenditure for the year ended on that date, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Montreal, Canada,
March 9, 1973.

H. Marcel Caron, C.A.
of Clarkson, Gordon & Co.
Chartered Accountants

Samson, Bélair, Côté, Lacroix
et Associés
Chartered Accountants

Hydro-Quebec Employees' Retirement Fund

Statement of Revenue and Expenditure

(in thousands of dollars)
for the year ended December 31

		1972	1971
Revenue	Contributions: Employees	$ 5,020	$ 4,505
	Hydro-Quebec	9,884	8,917
		14,904	13,422
	Additional past service contributions less cancellations	24	58
		14,928	13,480
	Less refunded to employees leaving service	286	277
		14,642	13,203
	Revenue from investments	7,234	5,920
		21,876	19,123
Expenditure	Pensions paid	3,129	2,992
Net revenue transferred to reserve		**$ 18,747**	$ 16,131

See accompanying note

Hydro-Quebec Employees' Retirement Fund

Statement of Assets and Reserve

(in thousands of dollars)
as at December 31

		1972	1971
Assets (note)	Investments, at cost:		
	Bonds of, or guaranteed by the Province of Quebec	$ 88,476	$ 65,763
	Municipal and School Commission bonds	17,529	15,518
	Government of Canada bonds	336	336
	Other bonds	150	150
	(Par value $113,436, market value $104,526)	**106,491**	81,767
	Common stocks (market value $1,202)	1,497	1,497
	Short-term investment, guaranteed by the Province of Quebec	3,500	10,500
		111,488	93,764
	Accrued interest on investments	1,960	1,818
	Past service contributions receivable from employees	36	52
	Amount receivable from (payable to) Hydro-Quebec	785	(112)
		$114,269	$ 95,522
Reserve	Balance as at January 1	$ 95,522	$ 79,391
	Net revenue for the year	18,747	16,131
	Balance as at December 31	**$114,269**	$ 95,522

See accompanying note

On behalf of the Commission:
(signed) Roland Giroux
(signed) Paul Dozois

(signed) E.-A. Lemieux,
General Manager
Finance and Accounting

Montreal, March 9, 1973.

Hydro-Quebec Employees' Retirement Fund

Note to Financial Statements

December 31, 1972

These statements show only the position of the assets of the Hydro-Quebec Employees' Retirement Fund, but do not purport to show the adequacy of the fund to meet the obligations of the Hydro-Quebec retirement plan, which are guaranteed by the Commission. An actuarial survey of the obligations of the plan as of December 31, 1971 shows an actuarial deficit in respect of services prior to 1966 of approximately $30 million, and an experience deficiency at December 31, 1971 of approximately $9 million.

At December 31, 1972 the Commission had provided in its accounts an amount of $6,319,000 for the amortization of the above deficits and will pay this amount to the Retirement Fund in 1973. In addition, the Commission will assume the annual amortization ($2,107,000) of the initial actuarial deficit over a period ending December 31, 1995. As a result, the contributions are sufficient to cover obligations in respect of current services, interest on the above actuarial deficit in respect of past services, and the amortization of this deficit over a period ending December 31, 1995.

HYDRO-QUÉBEC GENERATING STATIONS

in service or under construction at December 31, 1972

Generating Stations in Service

Hydroelectric

	(kilowatts)
1 — Beauharnois	1 574 260
2 — Manic 5	1 292 000
3 — Manic 2	1 015 200
4 — Bersimis 1	912 000
5 — Outardes 3	756 200
6 — Bersimis 2	655 000
7 — Carillon	654 500
8 — Outardes 4	632 000
9 — La Trenche	286 200
10 — Beaumont	243 000
11 — La Tuque	216 000
12 — Paugan	201 975
13 — Manic 1	184 410
14 — Rapide-Blanc	183 600
15 — Shawinigan 2	163 000
16 — Les Cèdres	162 000
17 — Shawinigan 3	150 000
18 — Grand'Mère	148 075
19 — Chelsea	144 000
20 — La Gabelle	123 750
21 — Rapide-des-Iles	109 890
22 — Rapides-Farmers	98 250
23 — Première-Chute	93 150
24 — Rapides-des-Quinze	89 600
25 — Rapide 7	57 000
26 — Bryson	56 000
27 — Rapide 2	48 000
28 — Rivière-des-Prairies	45 000
29 — Chute-Hemmings	28 800
30 — Hull 2	27 280
31 — Sept-Chutes	18 720
32 — Saint-Narcisse	15 000
33 — Drummondville	14 600
34 — Métis 1	6 400
35 — Pont-Arnault	5 450
36 — Chute-Bell	4 800
37 — Métis 2	4 250
38 — Saint-Alban	3 000
39 — Saint-Raphaël	2 550
40 — Sherbrooke	2 256
41 — Chute-Garneau	2 240
42 — Corbeau	2 000
43 — Magpie	1 800
44 — Rawdon	1 720
45 — Chute-Burroughs	1 600
46 — Sainte-Adèle	1 280
47 — Chute-Wilson	840
48 — Anse-Saint-Jean	400
49 — High-Falls	340
50 — Thurso	275

Thermal

	(kilowatts)
51 — Tracy	600 000
52 — Les Boules	36 000
53 — Cap-aux-Meules	13 949
54 — Havre-Saint-Pierre	6 000
55 — Blanc-Sablon	1 900
56 — Natashquan	1 750
57 — Fort George	1 100
58 — Harrington-Harbour	1 050
59 — La Baleine	1 000
60 — Saint-Augustin	1 000
61 — La Tabatière	825
62 — La Romaine	775
63 — Parent	700
64 — Ile-aux-Grues	425
65 — Johan-Beetz	355
66 — Ile-d'Entrée	295

Total installed capacity of hydroelectric generating stations (50)	10 439 661
Total installed capacity of thermal electric generating stations (16)	667 124
Total capacity in service at December 31, 1972	11 106 785

Under Construction

67 — Manic 3 in service 1975-76	1 183 200
68 — Outardes 2*	454 000

Nuclear

69 — Gentilly**	250 000

*Work was suspended in 1968

**Not yet owned by Hydro-Québec and therefore excluded from total

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LITHO CANADA


Legend
Hydraulic generating stations
Thermal generating stations
Hydraulic generating stations under construction
Major substations
Nuclear generating station
735 kV
735 kV future
345 & 315 kV
230 kV
161 kV
120 kV
HUDSON BAY
JAMES BAY
LA GRANDE BALEINE RIVER BASIN
CANAPISCAU RIVER BASIN
LA GRANDE RIVIERE BASIN
EASTMAIN RIVER BASIN
RUPERT RIVER BASIN
BROADBACK RIVER BASIN
NOTTAWAY RIVER BASIN
UNGAVA BAY
QUÉBEC
ONTARIO
USA
NEW BRUNSWICK
PRINCE EDWARD ISLAND
NOVA SCOTIA
NEWFOUNDLAND
ANTICOSTI
ST. LAWRENCE RIVER
Towards Churchill Falls
Montagnais
Matagami
Chibougamau
Quévillon
Normétal
Figuery
Senneterre
Rouyn
Pandora
Cadillac
Provencher
Val d'Or
Louvicourt
Kipawa
Campeau
Maniwaki
Mont-Laurier
N.D. du Laus
Alcan property
Lac Saint-Jean
Micoua
Manicouagan
Baie-Comeau
Hauterive
Arnaud
Sept-Iles
Gaspé
Copper Mountain
Micmac
Chandler
Les Boules
Rimouski
Cascapédia
Matapédia
Rivière-du-Loup
Îles-de-la-Madeleine
Laurentides
Jacques-Cartier
Québec
Lévis
Trois-Rivières
Nicolet
Sorel
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