



CHAPTER 3

# Expanding Power

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1920 – 1929

**BELOW:** *A growing number of customers took advantage of a variety of electrical conveniences in the 1920s.*



**O**n May 1, 1922, Alberta’s first commercial radio station, CJCA, went on the air in Edmonton. The 50 W station was located in the offices of *The Edmonton Journal*. At the time, there were 200 radios in the city. By 1927, 10,000 licensed radio sets were in use in Alberta. For the first time, Albertans in isolated parts of the province could hear news, weather, and entertainment programs. They could also learn about the lives and interests of other people in the province.

During the 1920s, the applications of electricity greatly diversified. While radio was enabling people to learn about the wider world, other electrical appliances were transforming people’s domestic lives. In Edmonton and Calgary, electric wringer washers replaced washboards, and brooms were sacrificed to the vacuum cleaner. Kerosene lamps were relegated to

## MILESTONES

**1923**

Natural gas is first used for domestic purposes in Edmonton.

CKCK Regina makes Canada’s first radio broadcast of a hockey game.

**1924**

Oil is struck in Turner Valley, southwest of Calgary.

**1926**

Blatchford Field, Canada’s first municipal airport, is established in Edmonton.

**1927**

Canada celebrates its sixtieth anniversary as a nation.

Canadian Utilities begins generating electricity for small Alberta communities.

**1928**

The City of Edmonton installs one of the world’s largest 10,000 kW turbine generators at its Rosedale plant.

**1929**

Alberta pilots Wilfred “Wop” May and Vic Horner fly desperately needed diphtheria antitoxin to Fort Vermilion.

Emily Murphy and Nellie McClung succeed in having British courts declare that Canadian women are legally “persons.”



### WILLIAM J. CUNNINGHAM

Obsolete technology and massive demand increases posed just a few of the challenges that faced Edmonton's electrical utility during the 1920s. Fortunately, an able manager was available to guide the Rosedale Power Plant through this tumultuous period. William J. Cunningham, a soft-spoken man with a strong English accent, was born in Altrincham, England in 1886. He studied engineering at the University of Manchester, and eventually moved to North America to work for the City power plant in Calgary. By 1915, he was assistant superintendent of the plant.

Later, Cunningham left his job to join the war effort. His skills were valuable to the Royal Gun Factory in Woolwich, England, where he worked as a munitions inspector. After the war, Cunningham returned to Calgary and resumed his work at the power plant. In 1919, however, Cunningham accepted a job as the superintendent of Edmonton's power plant. Cunningham's job in Edmonton would expand twice over the following few years: in 1920, he was made responsible for the water plant, and in 1925, he was asked to manage the city's electric railway system.

Cunningham was intimately concerned with the day-to-day work of the areas he managed. He kept himself informed of the latest innovations in engineering technology. In 1927, he traveled to England to visit other power plants and learn about innovations in electrical technology. During his tenure at the Edmonton power plant, Cunningham used his knowl-

edge and credibility to advise city politicians on costly expansions as well as collaborations with other companies.

Like many Rosedale managers before and since, Cunningham was active in many voluntary associations in Edmonton. He was president of the Association of Professional Engineers of Alberta and of the Edmonton Golf and Country Club; he was also a member of the Masonic Lodge.



Unfortunately, all of this activity, coupled with hard work and heavy responsibilities, may have cost Cunningham his health. In 1934, he suffered a major stroke and died at 47 years of age. His death shocked city officials. According to an account in the May 14, 1937 issue of *The Edmonton Bulletin*,

*[Cunningham] was highly regarded by civic officials with whom he worked and also by the large staff of employees of both the power and street railway departments for his fairness, good nature, and unceasing efforts to better conditions in the branch of industry in which he attained such a high place.*

Sources: *The Edmonton Journal*, 1934, 1935, 1937; *Edmonton Bulletin*, 1934

**LEFT:** William Cunningham.

**BELOW:** Chain grate stokers used with a boiler installed in 1914. Cunningham is in the right foreground wearing a white shirt and tie.





**ABOVE:** *As soldiers returned from World War I, demand for electricity skyrocketed.*

garden sheds and electric light bulbs hung from the ceilings of many urban homes. This trend toward greater consumption, coupled with a growing population, meant explosive increases in demand for electricity.

### MANAGEMENT AT THE UTILITIES

William Cunningham was the superintendent of Rosedale Power Plant in the 1920s. Although Rosedale was managed separately from the electrical distribution system (which was called the Electric Light and Power Department, and was managed by superintendents Barnhouse and Murphy) during this time, many other aspects of the city's

infrastructure came under Cunningham's wing. In 1920, Cunningham began to manage the water treatment and pumping plant. This was a logical arrangement, as the power plant provided the electric energy and steam necessary for the operation of the pumps, filters, and other equipment that the pumping and filtration systems needed. The power plant also provided warm water to keep the treatment plants, filters, and the distribution mains operational in cold weather. The power plant supplied direct current electricity to the street railway; thus, Cunningham came to manage the streetcar system as well.

### A GROWING DEMAND

Between 1920 and 1929, Edmonton's population grew from 61,045 to 74,298.

One of the reasons for this growth was the number of soldiers returning from the battlefields of World War I. It was a time of relief and optimism following the harsh days of war; thus, new industries were established and both factories and homes were built. Construction boomed, more than doubling in the latter half of the decade.

According to a table that appeared in *The Edmonton Journal* in 1935, Edmonton's Electric Light and Power Department had 15,445 electricity customers in January 1921. By January 1930, this number had increased to 20,082. The demand for electricity in the same period rose from 1,266,900 kWh for January, 1921 to 3,515,163 kWh for the same month in 1930.

The power plant required expansion





**RIGHT:** *The General Electric-Curtis turbo-generator that was installed in 1921.*

due to increased demand and the need for greater reliability. Electricity was no longer just a convenience or a luxury by the 1920s: it had become a necessity. Superintendent Cunningham recognized this fact:

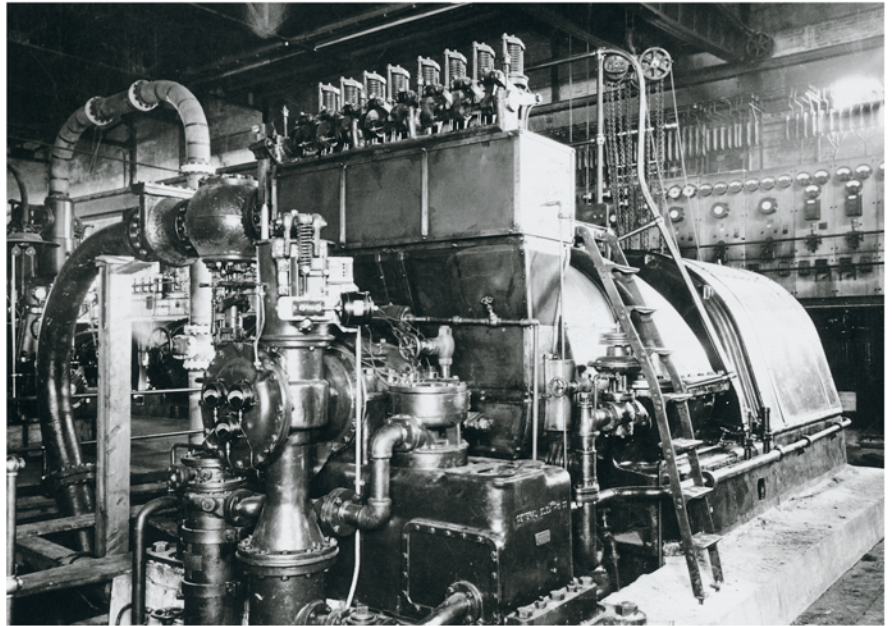
*The supply of energy must not fail for one second – the lighting of the homes, hospitals, public buildings, and streets are dependent upon it. The wheels of industry must be kept turning by the manifold applications of the electric motor, and transportation provided by the energy supplied to the street railway lines. In case of trouble arising in the complicated structure of producing and delivering energy, the first aim of the staff is to maintain and restore the service, no matter what the cost.*

## NEW EQUIPMENT NEEDED

Between 1914 and 1921, the generating capacity of the Rossdale Power Plant did not expand. As demand increased during this time, more pressure was placed on rapidly aging equipment. In 1920, machinery breakdowns, overhauls, and repair work cost the city a staggering \$56,865. As Superintendent Cunningham noted:

*Probably owing to the fact that the first period of growth occurred during the years in which rapid development was taking place in the design of electrical machinery, a large amount of equipment was installed which quickly became obsolete.*

Throughout the 1920s, the city would invest in new and innovative equipment



that would expand the installed generating capacity of the Rossdale Power Plant to 23,000 kW. A 5,000 kW General Electric-Curtis turbo-generator with a Wheeler condensing plant was installed in 1921. To accommodate this equipment, the basement floor of the power plant was excavated and a new foundation was built. The leaky roof over the engine room was replaced, and a transformer and switching station were built.

In 1922, old and dangerous switching control equipment was also replaced. New circuit breakers, bus-bar equipment, and three new transformers were installed. In the end, Rossdale's entire output was operated by remote control from the board located in the turbine room.

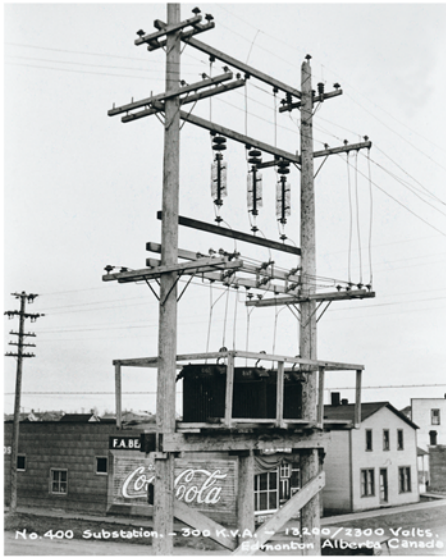
The greatest source of pride for staff at the power plant during the 1920s was the 10,000 kW Parsons turbine generator that operated at a speed of 3,600 RPM. Installed in 1927, this piece of equipment represented a major technological advance. Previous machines were smaller

or ran at lower speeds. The new high-speed generator was the first of its type installed in North America. It cost the city \$215,000. It demonstrated the progressive, courageous attitude of the City and the utility. Sir Charles A. Parsons and Lady Parsons traveled to Edmonton from Newcastle-upon-Tyne, England, to commission the unit in 1929.

## DISTRIBUTION

The effective distribution of electricity was also a priority for Edmonton's power managers in the 1920s. Bus bars, feeders, and transformers were updated. In 1922, a 13,200 V ring main feeder system was started. Many new substations were built. Substations were distribution centres where voltage was reduced from 13,200 V to 2,300 V. This lower level of voltage was carried down streets and lanes and converted to 110 V for use in the homes of residential customers. According to Electric Light and Power Superintendent Barnhouse, substations made it possible for linemen





**FAR LEFT:** 400 Substation in the 1920s.

**LEFT:** Fifty-foot poles were erected across Edmonton to carry telephone, power, and street railway lines.

the demand for power, which increased as the railway system expanded.

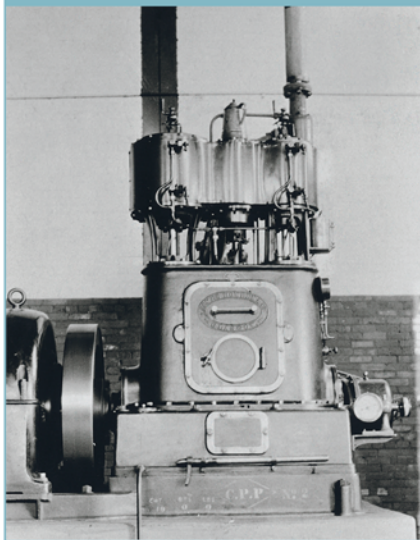
With the return of the soldiers following World War I, ridership on the brown and yellow electric streetcars increased steadily. Railway lines were extended and more streetcars were purchased. The aging equipment at the power plant and motor generators at 100 Substation could not keep pace with this increase. Equipment breakdowns meant that rail service was interrupted for days at a stretch; in one case, a short circuit in one of the motor generators took four days to repair.

In March 1927, Superintendent Cunningham put in an urgent request to City commissioners recommending that a second-hand 750 kW motor generator be purchased from the City of Calgary, to be used to provide electricity for the street railway. The request was granted. The purchase cost \$17,000, including dismantling, freight, and installation of the unit.

In 1929, a mercury arc power rectifier was purchased to convert alternating current to direct current for the street railway. This increased the supply of current available to the railway system by making the total output of Rossdale eligible for powering streetcars.

In the long term, Cunningham proposed building additional substations and replacing outdated equipment to effectively deal with the streetcar problem. While City commissioners embraced Cunningham's proposals, the Great Depression of the 1930s would

### A MEMORABLE MACHINE



The 10,000 kW Parsons turbine generator that was installed in Rossdale with so much pride in 1927 was sold to Saskatchewan Power in 1950. The Saskatchewan utility did not take with it the Howden exciter and steam engine (LEFT) that had worked with the generator. It was therefore decided to place the exciter on a small pedestal between the sundial and the flagpole which were then in front of the Rossdale office. Unfortunately, politicians raised concerns about this arrangement and the machine was sold for scrap.

to make repairs to the distribution network in one part of the city without shutting down the main power line.

### THE STREET RAILWAY

Edmonton's power plant provided electricity to the electric streetcars that rumbled along the city's main arteries. The production of direct current for the street railway posed special problems. In the early 1920s, motor generators at 100

Substation (located at 80 Street and 115 Avenue) produced 1,200 kW for the railway. Generators at the Rossdale Power Plant produced an additional 2,200 kW for the service. Since power was supplied from these two centres only, the drop in voltage was excessive at various points on the streetcar system, making it difficult for the cars to start moving again after dropping off passengers. The problem was made worse by

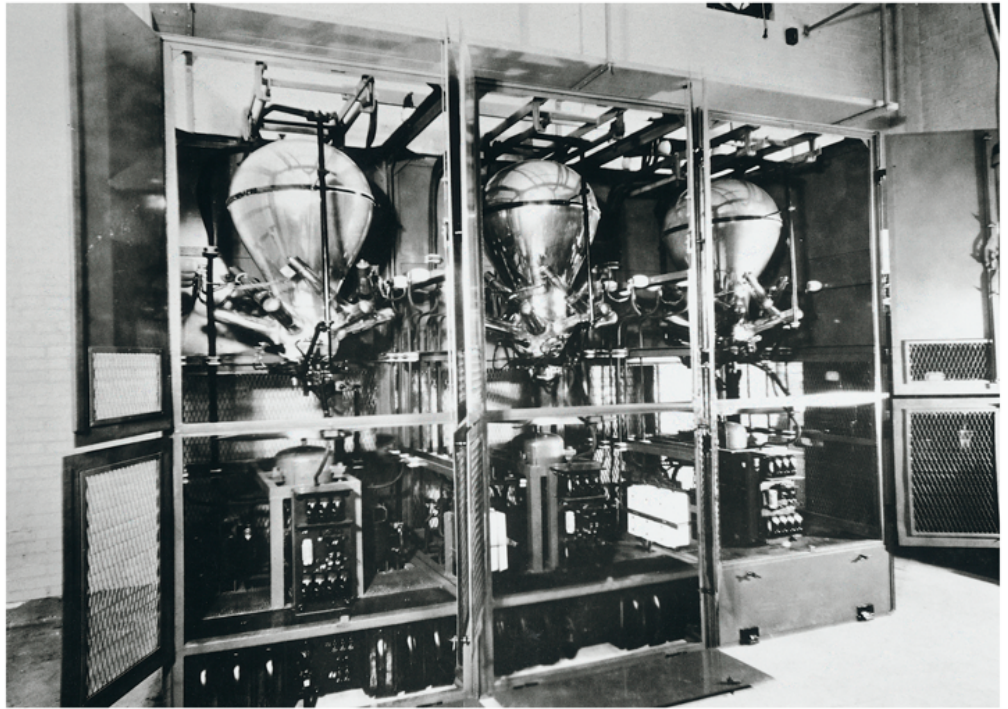


delay the implementation of many of them. Provision of power to the street railway would continue to be a technically demanding and financially draining problem for superintendents and City commissioners alike for many years to come.

### THE TROUBLE MAN

The proliferation of electrical appliances in the 1920s may have made life easier for consumers, but it also meant that more things could go wrong. In the early 1920s, a customer who noticed a strange burning smell coming from an electric wringer washer might call the

**RIGHT:** *Early mercury arc rectifiers such as these were used to convert alternating current into direct current to power the street railway.*



### COAL AND ASH

Rossdale Power Plant frequently turned to new generating equipment to increase efficiency and output. However, there were other ways to meet production goals. A more efficient and reliable coal handling system was one. A new coal crusher was purchased and installed in December 1920. Mechanical coal stokers to feed several of the boilers were added in 1922. Boiler-induced draft fans were also installed. These additions improved efficiency so effectively that boilers installed in 1914 were able to function until 1931.

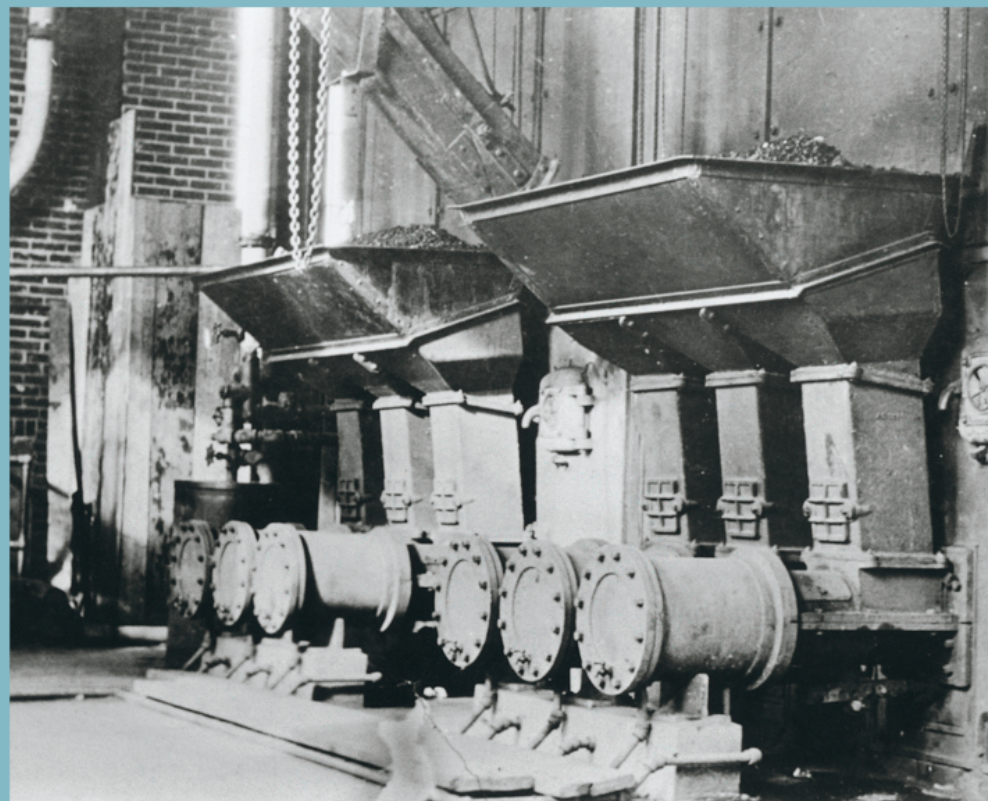
Steps were also taken to improve the plant's ash disposal system. In 1921, a light industrial track with dump cars was installed in the basement of the plant. These cars removed ashes and dumped them into an underground bunker. A locomotive crane removed the ashes from the bunker and loaded

them into railway cars.

The disposal system modifications were successful: in 1922, 18 men were

needed to remove the ash. A year later, only 8 men were required.

**BELOW:** *Stokers at Rossdale in 1923.*





Electric Lighting and Power Department’s “trouble man.” He would appear on the customer’s doorstep, attempt to find the source of the problem, and fix it.

The trouble man was on duty until midnight every day except Saturday and Sunday. On those nights, the trouble phone was switched to 100 Substation so the substation operator could respond to calls. By 1926, this arrangement was no longer practical.

In a December 6, 1926 letter to City Commissioner Mitchell, Electric Light and Power Superintendent Murphy asks that trouble service be extended to include the weekends.

### THE FIRST NEON SIGNS

Neon signs were first installed along Calgary’s Eighth Avenue and Edmonton’s Jasper Avenue in 1928. Though signs lit with incandescent bulbs were common, neon was an entirely new and enchanting way to advertise, and quickly gained popularity.

Advertisements urged merchants to write their messages “... in letters of fire – Neon.” At first, the signs were available only in red – the colour naturally emitted when electricity passes through neon gas. The lettering on the Darling’s Drug Store sign installed at the corner of Jasper Avenue and 102 Street in December, 1928 owed its crimson colour to neon gas. There was truth to claims that neon made “indelible impressions” on the minds of customers, because many Edmonton residents still remember the Darling’s Drug Store sign.

*Adapted from The Spirit of Alberta: An Illustrated Heritage, by Helen La Rose*

*As an example of the necessity for this arrangement, we might refer to the case of trouble that occurred in the north end district about a week ago ... The office trouble man went off duty at 7 PM and phone calls were switched to the substation; as the substation operator was then busy testing switches, etc., it was not possible for him to give proper attention to the many phone calls received.*

Mitchell agreed to Murphy’s request. Late that month, weekend trouble service was established, with the “trouble man” receiving \$4.00 for each six-hour weekend shift.

### LIGHTING UP THE STREETS

Traffic jams were becoming common in Edmonton by 1927, as there were between 7,000 and 8,000 cars in the city. “Tin Lizzies” – Model T Fords – vied for parking spots in Edmonton’s market square (now Churchill Square). Trucks

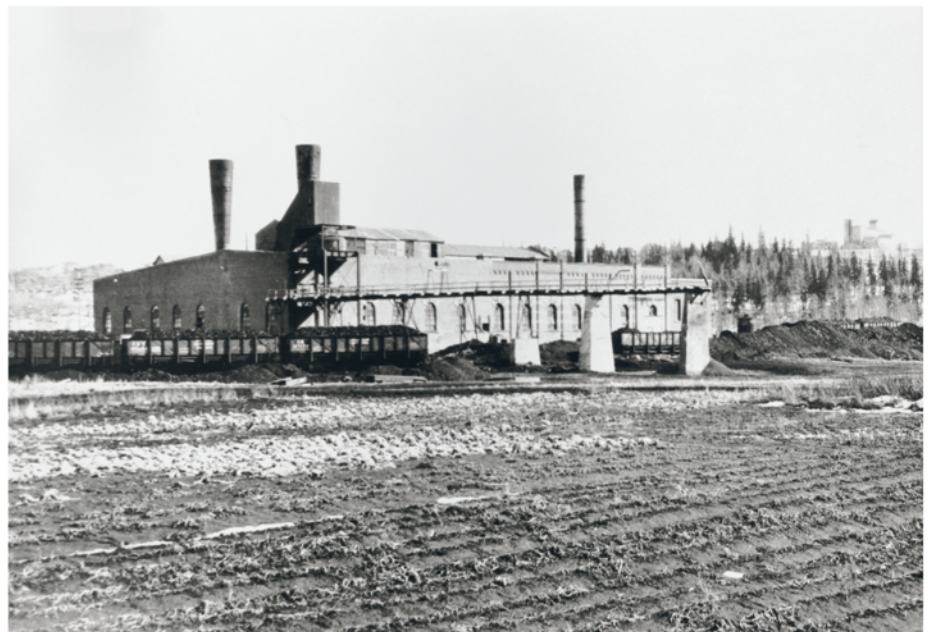
**BELOW:** *Edmonton’s electricity generating station as it appeared in the early 1920s.*

replaced horse-drawn delivery wagons. As the number of automobiles grew, so did the need for improved street lighting. Edmonton’s Electric Light and Power Department responded by increasing the number of streetlights to 2016.

### A PROFITABLE VENTURE

Even with a large number of equipment purchases, the City’s electric utilities were able to maintain healthy surpluses throughout the 1920s. In 1928, Edmonton’s Electric Lighting and Power Department showed a surplus of \$1,593,433. That same year, the Power and Pumping Plant had a surplus of \$1,186,039. The benefits of these surpluses were passed on to customers in the form of lowered rates. The basic rate for electricity in the 1920s hovered between \$0.07 and \$0.08 per kWh, with the average customer paying between \$4.46 and \$5.10 per month for electricity.

Attracted by the healthy balance sheets, Canadian Utilities offered to purchase





## PRIVATE VS. PUBLIC

Albertans have long debated the merits of public ownership of their municipal electric utilities. A pamphlet entitled "Opposition to Public Operation" circulated in Edmonton in the 1920s, promoting the benefits of private ownership of utilities. It argued that "men who are competent to run great enterprises are not in politics, and if they are hired to run municipal utilities they are too much hindered by politics."

It seems that many Albertans agreed. Small private companies generated power for many of Alberta's

communities in the early years of electricity. Except for a brief period in its history, Edmonton was the exception to this rule. While operation of the utility would at times be "hindered" by politics, Edmonton would eventually have the largest public power system in Alberta. In contrast, Calgary Power, Canadian Utilities, and Northland Utilities would buy out most of the local power plants in other parts of the province.

**BELOW:** *In the 1920s, Albertans were subjected to persuasive advertising that argued for privately-owned utilities.*



### To Make a Kilowatt-hour

Municipal plants, } . While, } companies use this  
use this much } fuel and labor } much  
fuel and labor }

Municipal plants, according to the United States census, use nearly three (2.7) times as much fuel and labor as companies do to produce one kilowatt-hour

Edmonton's electric system in 1928. In a report that year, Superintendent Cunningham explored the advantages and disadvantages of a sale. Cunningham pointed out that selling the utility would remove the immediate necessity of buying much-needed new equipment and expanding Rosssdale Power Plant. However, all investments in the utility were quickly recouped through increased sales of electrical power.

The offers to purchase Edmonton's electric light and power system were quickly rejected. As Commissioner Mitchell stated:

*The fact that today certain powerful private interests are knocking at the door to be heard in support of their proposals to undertake the operation of some of these utilities on supposedly advantageous terms, merely goes to prove that they recognize the value of the City's utilities as a large field of industrial development which, with its promising future, warrants a considerable investment of capital in acquiring these utilities.*

## ATTENTION – CITIZENS OF EDMONTON!

Although the City refused to sell its power utility to a private firm, it did not close the door to all collaborations with private enterprise. A memo dated December 28, 1928 provides the earliest evidence that such a collaboration was under consideration. In this memo, Power Plant Superintendent Cunningham briefly explores the implications of a possible interconnection of Edmonton's electrical supply with the system operated by Calgary Power Ltd.

On March 11, 1929, Calgary Power







Ltd. submitted a proposal to sell secondary power to, and interchange power with, the Rosedale Power Plant. In an August 23, 1929 report exploring the implications of such a relationship, Cunningham states that the existing equipment at Edmonton's power plant could not be expected to meet the growing peak load demands projected for the winter of 1930 – 1931.

According to Cunningham, Edmonton had two options: it could build a new extension to the Rosedale Power Plant, which meant purchasing efficient but expensive machinery. Or, it could enter into a mutually advantageous relationship with Calgary Power in which resources would be pooled. Cunningham believed that Calgary Power's offer looked good in theory, but knew that, in practice, it would require extreme care to ensure efficiency and low power costs. It would also only delay the need to purchase equipment; Edmonton would still need to replace machines that were rapidly becoming obsolete.

Cunningham knew that Calgary Power was developing a province-wide system of generation and transmission. By providing industries with competitive rates for power, the company was also attracting many large manufacturing businesses to Calgary. Manitoba Steel and Iron and the Dominion Bridge Company Ltd. had both located in Calgary because of lower energy costs. In Cunningham's view, if Edmonton and Calgary were receiving their electrical energy from a common system, this difference would be removed and the

playing field would be more level.

Not all of Edmonton's citizens were enthusiastic about the possibility of their publicly-owned utility entering into a relationship with a privately-owned company. In at least one case, flyers were distributed and a public meeting held to protest the interchange with Calgary Power. One handbill read:

*Attention – Citizens of Edmonton!  
The aldermen are PLEDGED to PUBLIC OWNERSHIP. Without any mandate from the people they now intend to enter into an agreement with Calgary Power Company. The agreement is in effect a FRANCHISE. It is an attack on PUBLIC OWNERSHIP! THE THIN EDGE OF THE WEDGE! At its termination Edmonton will be at the mercy of Calgary Power Company. CALGARY POWER COMPANY IS NOT TO DELIVER POWER TO THE CITY UNTIL*

*THE SUMMER OF 1930. There is plenty of time to ascertain the wishes of the citizens. LET THEM DECIDE! The contract IS NOT favorable to Edmonton. Calgary Power will not bring industries to Edmonton. The motto of the Council should be EDMONTON FIRST! Attend the public meeting at the Memorial Hall on Thursday, September the 12th at 8:00 p.m.*

Despite these protests, Edmonton City Council accepted a modified version of Calgary Power's offer. Thus began a relationship that would provide ongoing challenges for the managers of both utilities for many years.

### BUILDING FOR THE FUTURE

Besides agreeing to collaborate with Calgary Power, the City adopted an earlier plan by Cunningham. This, an ambitious five-year proposal to improve the power plant, consisted of building an



**RIGHT:** Inside the Rosedale plant in the 1920s. The tallest unit is the 750 kW triple expansion and engine, installed in 1910 and removed in 1949.





extension to the existing plant, erecting new buildings, acquiring and installing new equipment, and disposing of old machinery.

Cunningham pointed out that the costs of these improvements should not concern the City of Edmonton:

*Provided the requirements warrant the expenditure, and the economic results attained absorb the increased charges, the amount of the investment is a secondary consideration. The City of Edmonton is actually only lending its credit for an investment which will produce large returns. This utility has not cost the citi-*

*zens of Edmonton one dollar, and by a further extension of credit, the result will be decreased charges for light and power than exist at the present time.*

Cunningham could not foresee the economic crisis that would soon blanket the world. The Wall Street crash and subsequent economic downturn would curtail some of the utility's ambitious expansion plans, but not for long. In 1930, the City of Edmonton would approve the first phase of Cunningham's proposal, and invest scarce dollars on expanding the Rosedale Power Plant to meet the need for electricity.

**ABOVE:** *In the second decade of the twentieth century, Edmonton's Electric Light and Power Department had its offices at 242 MacDougall Avenue. The people in this photograph may have staffed the early utility.*

