PUBLIC UTILITY REGULATION IN NOVA SCOTIA

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THE word "Public Utility", according to Section 2, sub-section B of Chapter 128 of the Revised Statutes of Nova Scotia, 1923, "The Public Utilities Act" is thus defined:

> The terms "Public Utility" and "Corporation" mean and include any corporation (other than a municipal corporation, except as hereinafter mentioned), company, person, association of persons, their lessees, trustees, liquidators or receivers, that now or hereafter owns or may own, operate, manage or control, or may be incorporated for the purpose of owning, operating, managing or controlling any tramway for the conveyance of passengers, or any plant or equipment for the conveyance of telephone messages, or for the production, transmission, delivery or furnishing of heat, light, water or power, either directly or indirectly, to or for the public, and also mean and include any city, incorporated town or municipality that now or hereafter owns or may own, operate, manage or control any plant or equipment for the production, transmission, delivery or furnishing of heat, water or power, either directly or indirectly, to or for the public, and also mean and include any city, incorporated town or municipality that now or hereafter owns or may own, operate, manage or control any plant or equipment for the production, transmission, delivery or furnishing of heat, light, water or power, either directly or indirectly, to or for any other city, incorporated town or municipality.

It is a far cry from the public utility service of ancient days, when water vendors toiled through the city streets with their goatskin bags, and camel trains bore the burdens of merchandise across the desert sands, to the vast and complicated enterprises which to-day render an indispensable service throughout the civilized world. Such water vendors and camels have not yet wholly disappeared from the public utility picture in remote areas, but the history of modern utility service is comparatively brief.

The first significant development came in 1652 when systems of water distribution, not radically different from our modern ones although using wooden pipes, made their appearance. Illumination by gas was first undertaken on a commercial scale in this country in 1817. Street cars had their origin only a few years later, although they were not electrically driven until 1888.

Illuminating gas and electric cars were both used in Europe several years earlier than in this country. The telephone was invented in 1876, and promptly came into limited commercial use. Commercial electric light service had its origin in 1882, and, although the youngest of the group of modern utilities, this industry has developed most rapidly and has outstripped the others in investment and volume of business. The first attempt at electric lighting in the City of Halifax was made by *Clayton & Sons* in the early eighties. Hundreds witnessed the exhibition.

In the fall of 1883 the *Halifax Electric Light Company* started the first electric lighting plant, Thompson-Houston arc system, organizers Dominick Farrell and associates. They built a larger plant at the Three Mile House to carry their increased load or total output, and closed the Black Wharf Plant. The Gas Company purchased the above Arc Light Company out at Three Mile House. In the fall of 1887, B. F. Pearson and associates started the first incandescent plant at the North West Arm under the name of the *Chandler Electric Light Company*, and at the Black Wharf started the *Nova Scotia Electric Light and Motor Company* in the fall of 1888. The "Halifax" and "Queen" Hotels had the first two incandescent installations in Halifax. About 1890 the *Halifax Illuminating and Motor Company* bought out the above companies. About 1895 the *Halifax Tram Company* organized and bought out the *Halifax Illuminating and Motor Company*. In 1897 the Halifax Tram Company purchased the Gas Company Electric Plant. In 1902 the Halifax Tram Company purchased the Heat and Light Company at the North West Arm, and installed the gas plant in its old home at Gas Lane. The first trolley car started out on February 12th, 1896.

The Telephone Utility is one of the oldest and largest public utilities, and perhaps the one which comes into direct contact with the most people in their workaday lives. The telephone was invented in 1876 by Alexander Graham Bell, a man well and favourably known in Nova Scotia, as during the last years of his life he made his home in Cape Breton, just outside of Baddeck. The first telephone in Halifax was installed in 1877, and the first actual commercial use of the service was at the Caledonia Mine, Cape Breton, also in the same year. At this time the receiver and transmitter were not separate, but the same instrument was used for both, being changed back and forth from ear to mouth. In 1878 the first long distance call in Nova Scotia was placed from Halifax to Truro. In 1879 the first switchboard to connect the different lines in Halifax became necessary. It was located in an office

on Hollis Street. No directory was issued until 1880, and the first one carried the names of 77 subscribers. A submarine cable was laid across Halifax Harbour in 1881 to provide direct Halifax connections for Dartmouth users.

Up until 1889 all lines were of open wire, festooned for the most part from roof to roof, with an occasional pole to fill in blank spaces. As the wires increased, the congestion became very great. It was relieved in 1889 by cable which took the place of the open wire. Until this time the service was all magneto; i.e., signalling was done by means of turning a crank, and talking current was supplied by batteries at each set. In 1901, however, what was known as a "common battery" system was installed in Halifax. This was a system which used energy furnished from the Central Office.

In 1909, when the Public Utility Board was formed, there were 10,539 telephones in Nova Scotia. Until then the Telephone Company, in common with all other Public Utilities in the Province, was more or less unregulated as far as Government supervision is concerned, but with the constant changes in the art of telephony and the steady increase in the number of telephones some regulation was deemed necessary, particularly to avoid discrimination between either individuals or communities. In 1936 there were 42,850 telephones in Nova Scotia. In 1921 the first automatic system east of Winnipeg was installed in Lorne Exchange in the City of Halifax. Since that time, the entire city has become automatic, and many other exchanges throughout the Province have also been supplied with this same type of service. There are now 15,637 automatic telephones in Nova Scotia.

In 1914 the *Rural Telephone Act* was passed. This Act was designed to assist those residents of poor and sparsely settled districts of the Province to secure telephone service, a subsidy being paid to aid Rural Companies to build their lines. Such Rural Companies might be termed the wards of the Public Utilities Board, as before they can be incorporated, the conditions under which they are to receive telephone service, the point of connection, etc., are laid down in an Order by the Board. The Board also supervises them, and sees that they make annual payments to a sinking fund, so that money may be available for the renewal of their line and instruments when these become worn out. There are now 190 companies operating under the provisions of the Act throughout Nova Scotia.

Conditions in connection with the Telephone Utility have changed considerably, as it is now possible to pick up a telephone

and talk from Halifax to Vancouver. It is, therefore, essential that both operating practices and rate schedules keep pace with other developments in the industry. Furthermore, very rapid progress has been made in the art of telephony, and as a result new problems are continually being presented by operating companies which require the consideration of the Board in order that the interests of the public may be safeguarded and the rights of the companies respected.

The *Public Utilities Act* was placed on the Statutes of Nova Scotia in 1909. This year 1937, therefore, will see the 28th anniversary of the passing of public utility legislation in Nova Scotia. The first Board consisted of Hugh MacKenzie, K.C., of Truro, Chairman, John U. Ross, K.C., of Pictou, Vice-Chairman, and Parker R. Colpitt of Halifax. Mr. MacKenzie died in October, 1911, after giving valuable service to the Board. In July 1912, Mr. John U. Ross, K.C., was appointed to the Chairmanship and Mr. R. T. MacIlreith, K.C., was appointed to the Board as Vice-Chairman. The late Mr. Justice Jenks, who was then Deputy Attorney General, acted as Secretary of the Board until 1912, when Miss L. B. Taylor, the present secretary, was appointed. On January 1st, 1929, the Board was re-constituted with Mr. R. T. MacIlreith, K.C., as Chairman, Mr. Arthur Roberts, K.C., as Vice-Chairman, and Mr. J. S. Roper, K.C., as the remaining Commissioner. Mr. Roberts was subsequently appointed a Judge of the County Court, and thereafter the Board has consisted of Mr. MacIlreith as Chairman, J. S. Roper as Vice-Chairman and Ira P. Macnab as the other Commissioner.

Since the year 1909 the Act has been amended and its scope has been greatly widened. Up to and including 1933, the Board regulated five classes of public utilities in the Province of Nova Scotia, namely, electrical, gas, telephone, tramway and water corporations. It also had jurisdiction under the *Rural Telephone Act*, and under certain sections of the *Nova Scotia Power Commission Act* dealt with matters of valuation referred to it by the Supreme Court of Nova Scotia. It also investigated pole line applications to the Minister of Highways, and if it is deemed necessary, recommends these.

By the terms of Chapter 2 of the Statutes of Nova Scotia, 1934, "The Gasoline Licensing Act 1934", the granting of licenses to wholesalers and to retailers, as well as the regulations of the distribution and sale of gasoline in Nova Scotia, was entrusted to the Board. This Act breaks new ground for which there are no established precedents, and has added largely to the duties of the

Board. Immediately after its passage it became necessary to make regulations and rules establishing the procedure to enable an applicant to secure a license, as well as to regulate the trade generally in this commodity. Hearings were held in various towns in Nova Scotia, and investigations were carried on in order that the Board might be informed as to the conditions then existing in the trade and what practices, the continuance of which acted against the public interests, should be curbed. The regulations and rules were made and published in the Royal Gazette of September 26th, 1934; since then they have had the force of law.

The following are the figures for 1913 and 1935 regarding public utilities which the Board has to regulate:

Electrical	**1913**	**1936**
Municipal	11	28
Private	20	26
Total	31	54
Gas		
Private	2	1
Telephone		
Mutual	31	207
Private	58	62
Total	89	269
Tramway		
Private	4	2
Water		
Municipal	29	33
Private	2	2
Total	31	35
Gasoline		
Retailers	None	1268
Wholesalers	None	7
Total	None	1275

It will be seen from this statement that the number of utilities has greatly increased during the years, except Tramways and Gas, and correspondingly, the work of the Board has increased.

All public utilities have to file a yearly report in accordance with the forms prescribed by the Board. These reports are public, and may be examined by any person at the office of the Board, Provincial Administration Building, Halifax, N. S. The object of the system is not only to give public and complete analysis, but to prevent excessive and fictitious increases of capitalization.

The Board has recently prescribed a new accounting system and new regulations. The object of the new regulations is to obtain from the reporting utility a statement of:—

1. Actual cost of property acquired;
2. Source and amount of all income;
3. The expenses incurred, classified under convenient headings, a sharp line being drawn between operating and capital expenditures.

All stock and bond issues must be approved by the Board under the Act, after public hearing duly advertised in the newspapers. It is the duty of the Board to fix all rates and regulations for public utilities, and make valuations of the property of such utility used, useful and necessary in whatever field the public utility is operating.

Under Section 101 of the Public Utilities Act, "A public utility shall be entitled to earn only the amount equal to 8% of the fair value of its property, assets and undertaking as found by the Board under the provisions of the Act. The said amount of 8% shall be in addition to operating expenses and taxes of all kinds, and to all just allowances made according to the rules and regulations of the Board." These rate hearings and valuation hearings are public and are duly advertised.

Under Section 72 of the Act, any five persons, firms or corporations may make a complaint to the Board that any of the rates, tolls, charges or schedules are in any respect unreasonable or unjustly discriminatory, and the Board after due notice to the public utility may fix a time for public hearing when such complaint may be heard.

Since 1913, rates generally have continued to go lower. Examination of the records will show that the first rate investigation made by the Board was in Truro in 1913, where the rate set was 16c. per kilowatt hour. To-day the average domestic customer in Truro is paying 4.20c. per kilowatt hour, and approximately the same rate is available to a large proportion of domestic consumers in the Province. As the rates have decreased, the average annual domestic consumption has more than doubled in certain areas, thereby indicating that where reasonable rates are available the average citizen of the Province will make use of modern labour saving devices.

The Town of Dartmouth first had continuous 24 hour electric service when the cable was laid crossing the Halifax Harbour in June, 1916. Rates at this time were 12½c. net per kilowatt hour

for general lighting service. In 1917 these rates were reduced by 20% or 25% where a contract was signed for five years. In 1927 the Board's standard form of rate was adopted in Dartmouth, and for residence service was 3c. per hundred square feet of floor area, 7c. per kilowatt hour for the first block, 2½c. per kilowatt hour for all excess (same as in Halifax). The next rate change was in December 26th, 1929, when the cost of current for the first block was reduced from 7c. to 5c. per kilowatt hour and all excess remained as in Halifax, at 2½c.

It is the duty of the Board to see that all reasonable extensions in the public utility service are made, and this has been done in many cases in the last few years by agreement with the public utility, and sometimes after public hearing.

Section 50 of the Act provides that no public utility shall abandon any part of its lines or works after these have been operated without the consent of the Board, and similarly it may not transfer any of its assets without the Board's consent. No rates can be charged except those fixed by the Board, and no free service can be given.

Perhaps no part of this work has given more satisfaction to the members of the Board than the redress of individuals' and local grievances for which no adequate relief had previously been provided. Numerous informal complaints have from time to time been presented for which there had previously been no remedy. The *Public Utilities Act* was intended to create a forum for such as these. It is noticeable that the number of cases thus brought before the Board is large and increasing.

The Board makes an annual printed report to the Legislature of the Province of Nova Scotia in each and every year. Its report for the year 1936 has been tabled. A perusal of this report, which can be obtained from the King's Printer, will be interesting and of great value to all customers of public utilities.

Rates charged for public utility service have gone through a correspondingly marked evolution. The original charges were of the so-called "flat" type, that is, a fixed sum for a given service during a stated period of time. Use of meters for gas and electric service, and rates based on their readings, came promptly as wide variations in use of such service developed. Gas meters were introduced in England in 1815, and the present type of such meters has been used without radical change since 1844. In the electric field the inadequacy of uniform rates for widely different quantities of service soon became apparent, and various forms of quantity discounts were applied. Even this plan, which many other classes

of business still find suitable, lacked certain refinements incident to so-called "load factor", and appropriate differentials were evolved.

In studies of rate theories, which were undertaken as early as 1892, it appeared that certain elements of cost which rates were intended to cover were wholly independent of the quantity of service required by a particular customer, and a system of so-called "demand charges" was developed, separate from but supplementary to charges for quantity of service.

In the standard electrical rates made by the Board in this Province, there are two parts: (1) Service charge; (2) Kilowatt hour charge.

With regard to the service charge, a story is told concerning the irate customer of a water supply company who complained that it was an outrage to charge for water which was "the free gift of the Lord to all." The head of the water company agreed, and wrote an order to his plant superintendent; "Please supply Mr. J. A. Vincent with free water whenever he comes to the pumping station to fill his pail." The water was free, it was the cost of delivery the customer was asked to pay.

This is comparable to the electric industry. Too much emphasis is placed on the cost of generating electricity at the power house, and not sufficient attention paid to the cost of delivery to the customer when, where and how required.

One cannot go to the power house for electricity, any more than to the river for water. Consequently, steel towers must be erected and high tension cables strung for many miles at a cost of hundreds of thousands of dollars to bring electricity from the generating station to the city. Here, sub-stations are built in which massive transformers are installed, in order to reduce the voltage of the current and send it over hundreds of miles of overhead or expensive underground service wires to users in every part of the extensive area served by the company.

According to a reliable report, issued in connection with one of the largest hydro-electric enterprises on the continent, the cost of generating current at the switchboard of a typical hydro-electric system is approximately seven per cent of the ultimate cost to the customer; the balance being for transmission, distribution and service. Local conditions might vary the ratio of cost in Montreal, but under any circumstances the cost of generating electricity is a fraction of the total. In Nova Scotia, owing to higher costs of generation, the seven per cent above mentioned becomes 20% to 25%.

Labour costs, raw materials, supplies, transportation facilities, equipment and practically every other factor in industry (including taxation) go to make up the customer's bill for electricity; which is available twenty-four hours a day at the time and place indicated, in any quantity at uniform quality to all users.

The service charge in Nova Scotia is decided on the basis of floor area. The floor area to be used in determining the charges shall be computed as follows:

> (a) The outside dimensions of the house shall be measured, omitting verandahs, bay-windows and similar projections. The area calculated from these dimensions shall be multiplied by the number of floors, and ten per cent deducted for walls, partitions, hall, etc. This result, taken to the nearest 100 square feet, is to be used as the basis of the charges.
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> (b) Basements and unfinished attics and outbuildings are not to be included unless regularly used as living or sleeping quarters, in which case the net area so used should be included.
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> (c) All areas less than 1,000 square feet shall be taken as 1,000, and all areas over 3,000 square feet shall be taken as 3,000.

The amount arrived at is what the Company receives for service on the consumer's premises, and the consumer who has the small house pays much less than the consumer with the large house.

As a consumer of commodities and services, the public believes that free competition between sellers is the best guarantee of low prices to purchasers. In the case of those commodities and services which, by universal assent it is agreed, can be furnished much more cheaply by a single agent, the public is stirred periodically by the fear that the prices charged for these commodities and services are not as low as they ought to be.

A light and power utility is one of the most intricate of all business enterprises; the means by which energy is drawn to the customers' equipment from the coal under the power house boilers is a complex affair. The public utility business operates under certain conditions of production, of demand and of cost, that are peculiar to it alone. Recognition of the generally accepted principles of public utility rate making must precede a well rounded consideration of rate schedules, and in particular that part of the rate structure commonly designated as the "Service Charge."

The rate structure is the financial balance wheel of public utility operation. In view of these facts the "Service Charge", an integral part of the rate structure, can be examined only after one has gained a full appreciation of the rather complex economic conditions under which all light and power utilities operate. This

economic background must therefore be clearly presented before proper consideration can be given to the "rate structure" and the "service charge." In order to convey something like an intelligent understanding of the situation, it is necessary to describe briefly the various parts of an electric power and lighting system, and the relationship of those parts to the service furnished to the light and power customer.

To the householder, the store manager, or the public generally, the obtaining of light or electric power appears to be a very simple affair. The individual just turns a switch and presto! the room is illuminated or the motor begins to turn over. Tracing the course of that energy from the time it was created until it was consumed in heating, to an incandescent temperature, the element in the light globe, or energyzing the poles of the electric motor, reveals that the process is a complicated one. The energy reached the customer's switch by passing in over the customer's wires and through his meter from the transformer on the pole in the lane. The electric power reached that transformer by passing along the copper wires which extend from the pole back to the commutator plates of the generator in the power plant.

The generator created that energy by revolving on its axis and carrying one magnetic field through another. The generator was forced around by a steam turbine. The coal under the boilers transformed the water in the boilers into steam which turned the turbines. This completes the sequence. Coal at one end becomes electric energy at the other—but only through the intervention of a large amount of very expensive scientific equipment.

Consumers in general are accustomed to paying only for what they get. Many persons cannot understand why they should pay a charge when they actually use no electric energy. The public recognizes the reasonableness of paying for a telephone a fixed charge regardless of the number of times the instrument and auxiliary equipment is used. A telephone company levies a fixed charge because all its costs go on regardless of whether the phone is used or not. Each new phone necessitates certain specific capital, outlays for equipment in the exchange and for connections between the new phone and the exchange. The cost and upkeep of these capital investments the subscriber has to pay.

From a consideration of this example, the soundness of which cannot be questioned, it must be concluded that the light and power consumer, once joined to the city's electricity system, becomes liable for contributions toward the maintenance and operation of the whole system, irrespective of his consumption of electric energy.

The outstanding characteristic of all public utilities is the very large capital investment that must be made before the commodity or service to be furnished can be supplied. In the case of the electric light and power utility, where coal is the source of energy, the first investment is for the purchase and installation of a highly complex steam generation plant, a steam turbine unit or series of units, and a series of electric generators. The second outlay is for the construction of a distributing system—calling for heavy capital investments in wires, transformers, and other equipment—to carry electric energy to points from which, later, it can be conveniently transferred to the customer's line and hence through his meter to his applicances.

Whenever a new customer asks to be connected to the light and power system, the utility has to make certain further capital expenditures to place its facilities at the disposal of that particular customer. These outlays consist of the wires used to join the consumer's house or store to the nearest step-down transformer, the meter which is placed in the consumer's premises, and the labour costs, involved in making these connections and installations.

In planning the size of the power plant installations, the management must estimate the maximum demand which customers will make upon the system. Such estimates are always based upon a consideration of the aggregate installed or connected demand of the consumers, because for each class of consumer there is a well established relationship between the installed demand and the maximum demand. From this it follows that the increases in connected consumer demand call for periodic increases in generating capacity at the power plant. This relationship between consumer connected demand and the size of the utility's investment in fixed assets is a fundamentally important characteristic of the utility business.

Another peculiarity of an electric light and power utility is the irregularity of the customers' demand for this service. It is well known that the consumption of electricity is at a maximum during the early hours of the morning, that it rises considerably at the noon hour, falls during the early afternoon, and reaches a peak between 5 and 6 p.m. when both commercial and domestic demands overlap. There are also fluctuations in demand as a result of weather conditions and the changing seasons, the highest peak of the year coming during the Christmas season, when commercial, industrial, and domestic loads are at a maximum.

An important characteristic of public utility operation is that once a customer is connected to the electric power system he can

rely upon receiving uninterrupted service. From the utility's standpoint this means capital outlays must be made to purchase generating capacity to the extent of one unit in excess, that calculated as necessary to meet the demand load at the seasonable maximum. To ensure satisfactory operation this extra or standby unit should be as large as the largest unit in regular use, for only by such a precaution can full, uninterrupted service be guaranteed.

Immediately the light and power utility is constructed, the fixed charges—such as interest on capital invested, depreciation, insurance and supervisory expenses—begin to accumulate, and these charges have to be met regularly out of income irrespective of the number of kilowatt hours of electricity drawn from the system by the connected consumers. The direct costs of creating electric energy to meet the consumers' demands constitute but one-third of the total operating costs of the public utility. From the fact that fixed charges amount to two-thirds of all costs it is clear that the electric utility should be assured of a considerable revenue irrespective of fluctuations in the total energy consumption by connected customers.

As a result of the conditions just outlined, it follows that the costs incurred by the light and power utility are relatively low for serving a customer whose consumption of energy is smoothly spread over the day and the year, and whose consumption is large in proportion to his maximum hourly rate of consumption; and, on the other hand, the public utility incurs heavy costs in serving a customer whose consumption of energy is irregular, with many sharp peaks, for such a customer's total consumption is low relatively to his installed demand.

In contrast with water or gas utilities, the product of the light and power utility cannot be produced at a uniform rate and stored to offset the peak load. Electric energy must be produced when it is being consumed, and, to avoid overloading of the system, production must always be sufficiently in excess of actual consumption to make up for line losses, for meter losses, and for the unpredictable fluctuations in the customers' day to day demands.

The same applies to the seasonal swing in consumption. The customer pays only for the energy which actually passes through his meter. The creation of this marginal surplus brings in no revenue. Therefore even these direct operating expenses are a part of the overhead operating costs of the system as a whole. Hence rates under which the energy is sold must be high enough to cover these as well as all the other charges previously mentioned.

Finally, unlike most producing and selling organizations, the public utility has to meet certain periodic costs such as meter reading, billing and collecting, that vary with the number of customer accounts and bear no relationship to the volume of commodity sold. Here is another "cost" that must be recognized by anyone who would criticize existing electric light schedules.

It is hoped that the foregoing may throw a little light on the regulation and control of the public utilities in Nova Scotia which to a large extent affect the lives of all the citizens of the Province.