# Central Electric Power Station Statistics

## Analysis of Data Gathered by Dominion Water Power Branch and Bureau of Statistics — Primary Power, Kinds and How Distributed — Review of Commercial and Municipal Stations—Capital Invested, Salaries and Wages

IN last week's issue of *The Canadian Engineer*, a summary was published of the census of central electric power stations in Canada. This census was taken by the Dominion Bureau of Statistics and the Dominion Water Power Branch of the Department of the Interior, working in co-operation with the Ontario Hydro-Electric Power Commission, the Quebec Streams Commission and other provincial departments. Complete data was given last week regarding all water-power developments in Canada, whether for central station or other purposes. The census also reveals considerable interesting data regarding the central stations in Canada, other than that included in our last week's exclusive report of the hydraulic developments.

The accompanying statistics include only central electric stations, that is, stations engaged in the sale of electrical energy; all other electrical establishments, such as electric railways, electro-chemical and other electrically operated industries being excluded.

TABLE 1—CENTRAL STATIONS IN CANADA

| | Commercial | Municipal |
|---|---|---|
| Number of stations | 323 | 343 |
| With generating equipment | 296 | 174 |
| Revenue from the sale of power | $ 29,135,399 | $ 15,401,449 |
| For lighting purposes | $ 9,610,835 | $ 8,792,804 |
| Capital invested | $282,818,495 | $ 73,185,673 |
| Employees | 5,135 | 3,712 |
| Total wages | $ 4,290,505 | $ 3,487,210 |
| Total horse power | 1,444,314 | 400,257 |
| Steam engines and turbines— | | |
| Number | 133 | 118 |
| Horse power | 117,452 | 62,748 |
| Water wheels and turbines— | | |
| Number | 456 | 163 |
| Horse power | 1,322,852 | 329,809 |
| Gas and oil engines— | | |
| Number | 52 | 61 |
| Horse power | 4,010 | 7,700 |
| Electrical generators— | | |
| Number | 627 | 316 |
| K.V.A. capacity | 1,086,546 | 300,975 |

### Capital Invested

The capital invested in central power stations totals $356,004,168, of which 79.5 per cent. is invested in commercial stations and 20.5 per cent. in municipal or publicly owned stations. These figures indicate that the capital cost of central electrical station systems in Canada per primary horse-power installed is $193, averaging $196 per horse-power for commercial stations and $183 per horse-power for municipal or publicly owned stations. This cost includes all capital invested in construction and equipment of hydraulic works, power stations, transmission and distribution system; real estate cash on hand; current assets; supplies, and all other items.

TABLE 2—POPULATION AND NUMBER OF COMMERCIAL AND MUNICIPAL CENTRAL STATIONS

| | Population | Commercial Stations | Municipal Stations |
|---|---|---|---|
| Alberta | 521,852 | 23 | 22 |
| British Columbia | 615,680 | 27 | 21 |
| Manitoba | 572,200 | 12 | 16 |
| New Brunswick | 364,375 | 15 | 9 |
| Nova Scotia | 511,829 | 23 | 13 |
| Ontario | 2,741,691 | 98 | 204 |
| Prince Edward Island | 93,728 | 6 | .. |
| Quebec | 2,239,276 | 96 | 26 |
| Saskatchewan | 673,945 | 20 | 32 |
| Yukon | 8,512 | 3 | .. |
| **Canada** | **8,343,088** | **323** | **343** |

### Power Installation

The primary power installation in central stations totals 1,844,571 h.p., of which 78.3 per cent., or 1,444,314 h.p., is installed in commercial stations, and 21.7 per cent., or 400,257 h.p., in municipal stations. Of the total primary horse-power installed, 1,652,661 h.p. is derived from water, 180,800 from steam and 11,710 from gas and oil.

TABLE 3—TOTAL PRIMARY POWER IN CENTRAL STATIONS

| | No. of units | H.P. Capacity in Commercial Plants | H.P. Capacity in Municipal Plants | Total per 1,000 Population |
|---|---|---|---|---|
| Alberta | 82 | 49,312 | 26,105 | 145 |
| British Columbia | 86 | 219,990 | 12,658 | 378 |
| Manitoba | 41 | 24,888 | 42,449 | 118 |
| New Brunswick | 40 | 15,488 | 2,245 | 49 |
| Nova Scotia | 55 | 13,855 | 3,589 | 34 |
| Ontario | 352 | 521,396 | 263,269 | 286 |
| Prince Ed. Island | 10 | 1,226 | ..... | 13 |
| Quebec | 232 | 586,851 | 19,231 | 271 |
| Saskatchewan | 81 | 1,048 | 30,711 | 47 |
| Yukon | 4 | 10,260 | ..... | 1,206 |
| **Canada** | **983** | **1,444,315** | **400,257** | **221** |

The total primary power installed in central electric stations throughout the Dominion averages 221 h.p. per thousand population. Yukon averages the highest with 1,206 h.p. per thousand population, British Columbia coming next with 378, Ontario 286, Quebec 271, Manitoba 118, New Brunswick 49, Saskatchewan 47, Nova Scotia 34, and Prince Edward Island 13. Population by provinces is the only feasible basis available for making a per capita analysis of the central station industry. The occupation of the population, and its varied density in different localities have a direct bearing on the market for electrical power, and consideration of these phases will assist in explaining the above variations in the per capita developments.

TABLE 4—CENTRAL GENERATING STATIONS AND THEIR ELECTRICAL EQUIPMENT

| | No. of Stations | No. of Units | K.V.A. Capacity | K.V.A. per 1,000 Population |
|---|---|---|---|---|
| Alberta | 43 | 67 | 52,266 | 100 |
| British Columbia | 46 | 95 | 152,743 | 248 |
| Manitoba | 22 | 39 | 45,904 | 80 |
| New Brunswick | 21 | 40 | 12,757 | 35 |
| Nova Scotia | 34 | 67 | 14,489 | 28 |
| Ontario | 143 | 329 | 604,024 | 220 |
| Prince Ed. Island | 6 | 9 | 1,118 | 12 |
| Quebec | 101 | 215 | 471,969 | 211 |
| Saskatchewan | 51 | 79 | 26,089 | 39 |
| Yukon | 3 | 3 | 6,162 | 724 |
| **Canada** | **470** | **943** | **1,387,521** | **166** |

The outstanding position which water power takes in the central station field is one of the features disclosed by the census returns. Out of a total installed primary capacity of 1,844,571 h.p., 1,652,661 or practically 90 per cent. is derived from water.

The Yukon develops 97.4 per cent. of its primary central energy from water. Ontario develops 95.7 per cent. from