As compared with the cost of generating power by small steam or oil engines, now used in districts in which electric supply is not available, the saving is still greater. Each water horse-power operating on a 48-per-cent. load-factor supplies 4,200 horse-power hours per year. The same number of horse-power hours developed in numerous small steam-engines using an average of 9 lb. of coal per horse-power hour, worth £3 per ton delivered into the boiler, would cost £50·7 in fuel alone, showing, compared with £11·7 for water-power, a saving of £39 per year per horse-power of power-station output. Compared with small oil and kerosene engines using 1 pint of oil per horse-power hour, costing 16s. per case delivered, the value of oil required to generate 4,200 horse-power hours is £52·5 per year, as compared with the average cost of water-power of £11·7—a saving of £40·8 per horse-power year. The actual saving in practice is about the average of these four figures—viz., £12·2 as compared with large steam plants, £17·8 as compared with gas-engine plants, £39 as compared with small steam-engines, and £40·8 as compared with small kerosene-engines; *i.e.*, an average saving over the whole output of £27 per horse-power year.

Of the average capital outlay of the water-power systems of New Zealand—viz., £104 per horse-power—more than one-half is in the reticulation, which would be required in any case, leaving the capital cost of the power plant and transmission less than £52 per horse-power. The actual capital costs of the power-plant main transmission-lines and main substations in a few typical cases of hydro-electric stations are as follows: Lake Coleridge, £39 per horse power; Waipori Falls, £32·5 per horse-power; Horahora, £35 per horse-power; Wairua Falls, £29 per horse-power.

The actual saving to the consumer after paying the whole cost of hydro-electric supply, including interest, depreciation, operating-expenses, maintenance, distribution and management charges at the actual average cost of the twenty-seven water-power stations of New Zealand—viz., £11·7 per horse-power year—is thus £27 per horse-power year, and is sufficient to pay off the whole of the capital cost of the power plant within two years. The actual revenue of the water-power stations is only £13·2 per horse-power year, so that, of the £27 saving, the supply authority realizes only £1 10s. and the consumer the remaining £25 10s. But this is none the less a real saving to the community in reducing the cost of production by this amount.

Ultimate Demand to be provided for.

The ultimate demand to be provided for is a very important question which must be kept constantly in view in considering the development both of the large Government schemes and the smaller local schemes designed to supply the local demand until the comprehensive Government system is available.

The basis of the general system laid out for the Dominion as a whole is a supply of 1 horse-power to each 5 head of population, or 0·2 h.p. per head. This was the basis laid down by Mr. Parry in 1918, and no reason has been found to depart from it. It is admittedly ample for all present purposes, but is not excessive considering the possible and probable development of electric cooking and special electrical industries; and in advantageous circumstances it is exceeded elsewhere. For instance, in Tasmania, with a population of 213,887 persons, the power already developed by the State in its first water-power station at Waddamana is 66,000 h.p.—a provision of 1 in 3·1 or 0·32 h.p. per head of population; and work is now in hand on a supplementary station higher up on the Shannon River for 15,000 h.p., which will bring the proportion up to 0·38 h.p. per head. The justification for this large development is, of course, the sale of a single block of 30,000 h.p. to the Electrolytic Zinc Company, and of another of 5,000 h.p. for the manufacture of carbide of calcium. It is anticipated that the provision of a surplus supply of electric power in New Zealand would attract similar large industries here.

In addition to this evidence, the following are the amounts of electric power actually installed in the various provinces of Canada as compared with the supply available in the four metropolitan districts of New Zealand:—

	Total Electric Horse-power installed.	Horse-power per Head of Population.
Ontario	1,212,650	0·41
Quebec	1,015,385	0·43
British Columbia	305,315	0·58
Manitoba	97,247	0·17
Nova Scotia	46,948	0·09
Alberta	33,187	0·05
New Brunswick	30,180	0·08
Yukon	13,199	3·17
Prince Edward Island	1,869	0·21
Saskatchewan	Nil	Nil.
Canada (total)	2,762,880	0·31
Tasmania	66,000	0·32
New Zealand	74,000	0·06
Canterbury District	10,000	0·09
Dunedin District	8,000	0·11
Auckland City	17,200	0·20
Wellington City	10,000	0·12

The Canadian figures for the various provinces are particularly instructive, illustrating both the large proportion of power per head of population in the industrial provinces and the comparatively small proportion in the purely agricultural and pastoral provinces. As compared with the proposed allowance for New Zealand of 0·2 h.p. per head of population, the large industrial provinces of Canada now use 0·41 to 0·58 h.p. per head, whereas the agricultural and pastoral provinces use from 0·05 to