

SECONDARY TRANSMISSION OR DISTRIBUTION SYSTEM AND SUBSTATIONS.

From the main substation lines, mostly at 11,000 volts, will radiate out to smaller low-tension substations and pole transformer substations supplying all the local authorities and large power-users. In a few districts where there are isolated loads of some size at considerable distance from the main substations it will be necessary to run out distribution-lines at 22,000 volts, which can also be tapped along the route in much the same way as the 11,000-volt circuits. These lines will supply low-tension substations from which the local authorities' power reticulation will begin. In other districts where there is a number of fairly large individual power-users close together, lines at lower voltage (3,300 volts) will be run, supplying such larger power-users direct at this voltage. This work will be continually growing, but to make available the load of 130,000 h.p. assumed as the basis of this report it is estimated to cost £13·04 per horse-power of plant capacity, or a total of £2,086,000.

From this point the balance of low-tension reticulation should be carried out by the local bodies, or whatever body obtains the license to supply certain areas, and the expense of such retail business should be controlled directly by the licensees, except in so far as the Department may, as mentioned later, advance sums on short-period loans to assist smaller licensees in putting in the reticulation within their areas, or to assist manufacturers in the installation of their electrical plant. It is proposed to make provision for having a maximum of £100,000 available at any one time for this purpose.

ASSISTANCE TO LOCAL BODIES.

To assist local bodies in reticulating their supply area, and so help to build up the load on the power-supply system and make it the more quickly come to the profit-earning stage, it is suggested that a fund should be provided for issue on short-dated loans to local authorities, or alternately to bear the cost of the Department carrying out reticulation work which will be taken over by local authorities as soon as it has been put into operation.

CAPITAL EXPENDITURE.

The complete estimate to provide for the general scheme of electricity-supply outlined herein then becomes—

						Amount.	Per Horse-power.
						£	£
Generating-stations (total plant capacity 160,000 h.p.)—							
			H.P.	Cost.	Per H.P.		
Mangahao	..	..	24,000	£438,654	18·30		
Waikaremoana	..	..	40,000	544,369	13·16		
Arapuni	..	..	96,000	1,078,700	10·80		
						2,061,723	12·88
Main transmission-lines shown on drawing E 116	..	..	..	..	..	1,553,880	11·22
Extra branch transmission-lines at lower voltage to main substations not on main lines						241,360	
Main substations	..	..	..	..	..	838,808	5·24
Distribution-lines and secondary substations	..	..	..	..	..	2,086,000	13·04
						6,781,771	42·38
Interest during construction	..	..	..	..	..	271,271	1·69
Assistance to local authorities and power-users	..	..	..	..	..	100,000	0·62
Working capital	..	..	..	..	..	150,000	0·94
Total	..	..	..	..	..	7,303,042	45·63

In the event of taking over the Waihi Company's Horahora works a further sum dependent on the terms arranged with that company would have to be added.

Throughout this report estimates have been based on a rate not exceeding 12 per cent. above pre-war prices. With the present unsettled condition of markets and supplies it is impossible to estimate exactly on works destined to be completed some time ahead, but even if the present high prices remain after the war the balance will still be in favour of such a scheme of development, for although the cost may be greater the cost of all competing powers will also be greater in much the same proportion, and the revenue obtained will be increased in the same proportion.

It will probably take ten years to carry out all the works included in the estimate. The initial expenditure on headworks would be heavy, but, on the other hand, the plant would only be installed as required to meet the growth of the load. The average rate of expenditure on the above assumption would be about £730,000 per annum.

FINANCIAL RESULT.

It may readily be inferred that, inasmuch as the estimated capital expenditure per horse-power does not exceed the expenditure per horse-power on the Lake Coleridge undertaking, the financial result will be satisfactory. The capital charges for interest, depreciation, and sinking fund at $7\frac{1}{2}$ per cent. will amount to £547,728 per annum. The working-expenses should not exceed £220,000