

As compared with last year these figures show a larger proportion of country supply, there being 1,990 country consumers as against 1,250 last year. With the development of the Electric-power Board districts it is anticipated that in the early future the number of country consumers will increase very rapidly, thus fulfilling the main object of hydro-electric supply in stimulating the output of primary products, and attracting the population to the country districts.

With regard to the systems of supply, the fifty-five stations of the Dominion (Table F) are operating on the following systems:—

	Number.	Kilowatts.	Proportion.
Three-phase, 50 cycles.. ..	18	26,690	58·3
Three-phase, 60 cycles.. ..	1	550	1·2
Single-phase, 40 cycles	1	235	0·5
Single-phase, 50 cycles	4	1,335	2·9
Single-phase, 60 cycles	1	75	0·2
Single-phase, 80 cycles	1	4,500	9·8
D.C., 3-wire, 460 volts.. ..	21	11,251	24·6
D.C., 2-wire, 230 volts.. ..	7	794	1·7
D.C., 2-wire, 550 volts.. ..	1	375	0·8
	55	45,805	100·0

The three-phase 50-cycle system has been adopted as the standard for the Dominion. To enable supply to be taken economically from the Government hydro-electric-supply systems it is necessary that all the distribution-systems as far as possible should be changed over to this standard system. Already 58·3 per cent. of the plant capacity installed is on the standard system, and several other plants are making arrangements to change over in the near future. It is thus anticipated that within a couple of years over 75 per cent. of the installed capacity of the Dominion will be on the standard system, with consequent economy in interchange of power and convenience in keeping spares and stocks.

With regard to the cost of operation (Table G), twenty-seven out of fifty-five systems are operating at a profit after paying capital charges, and the balance at a loss. This is due mainly to the rapidly increasing costs. These should be met as early as possible, either by increased economy in operation, increased output, or, where these are not available, by increased charges.

The comparison between the gross operating results of the North Island and the South Island systems (Table G) is valuable in view of the larger proportion of hydro-electric power in operation in the South Island. The figures for last year are as follows:—

	North Island.	South Island.	Total.
Population supplied	307,489	229,354	536,843
Number of consumers	34,107	24,342	58,449
Power installed (kilowatts)	27,099	18,706	45,805
Maximum load (kilowatts)	16,717	13,999	30,716
Capital outlay	£1,642,269	£1,611,601	£3,253,870
Units generated	42,233,651	57,661,879	99,895,530
Units sold	33,619,138	45,809,980	79,429,118
Units non-productive	8,614,513	11,851,899	20,466,412
Percentage, units non-productive	20·4	20·5	20·4
Total load factor	28·7	47·0	37·0
Total revenue	£372,940	£280,709	£653,649
Revenue per unit sold	2·66d.	1·46d.	1·98d.
Revenue per kilowatt P.H. maximum	£22·3	£20·0	£21·1
Total working-expenses.. ..	£233,158	£141,703	£374,861
Working-expenses per unit sold	1·66d.	0·74d.	1·13d.
Working-expenses per kilowatt P.H. maximum	£13·9	£10·1	£12·2
Total capital charges	£102,417	£109,741	£212,158
Capital charges per unit sold	0·74d.	0·57d.	0·64d.
Capital charges per kilowatt P.H. maximum	£6·1	£7·8	£6·9
Total annual costs	£330,048	£249,085	£579,133
Total annual cost per unit sold	2·40d.	1·31d.	1·75d.
Total annual cost per kilowatt P.H. maximum	£20·0	£17·9	£19·1

The present total capital outlay on electric-power supply in each of the two Islands is approximately the same (£1,600,000), but owing to the higher capital cost of hydro-electric plant the installed hydro-capacity in the North Island is less than in the South Island, where the majority of the plant is operated by water-power. On the other hand, the load factor and the output in units are higher in the South Island (45,800,000 units sold) than in the North (33,600,000 units sold) owing to the cheaper cost of production, and the total cost per unit sold is 1·3d. in the South Island as compared with 2·4d. in the North.

LAWRENCE BIRKS, B.Sc., M.Inst.C.E., M.I.E.E.,
Chief Electrical Engineer.