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DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

PUBLIC UTILITIES BRANCH

USE OF ELECTRIC POWER

IN

MANUFACTURING AND MINING INDUSTRIES

IN

CANADA

1933



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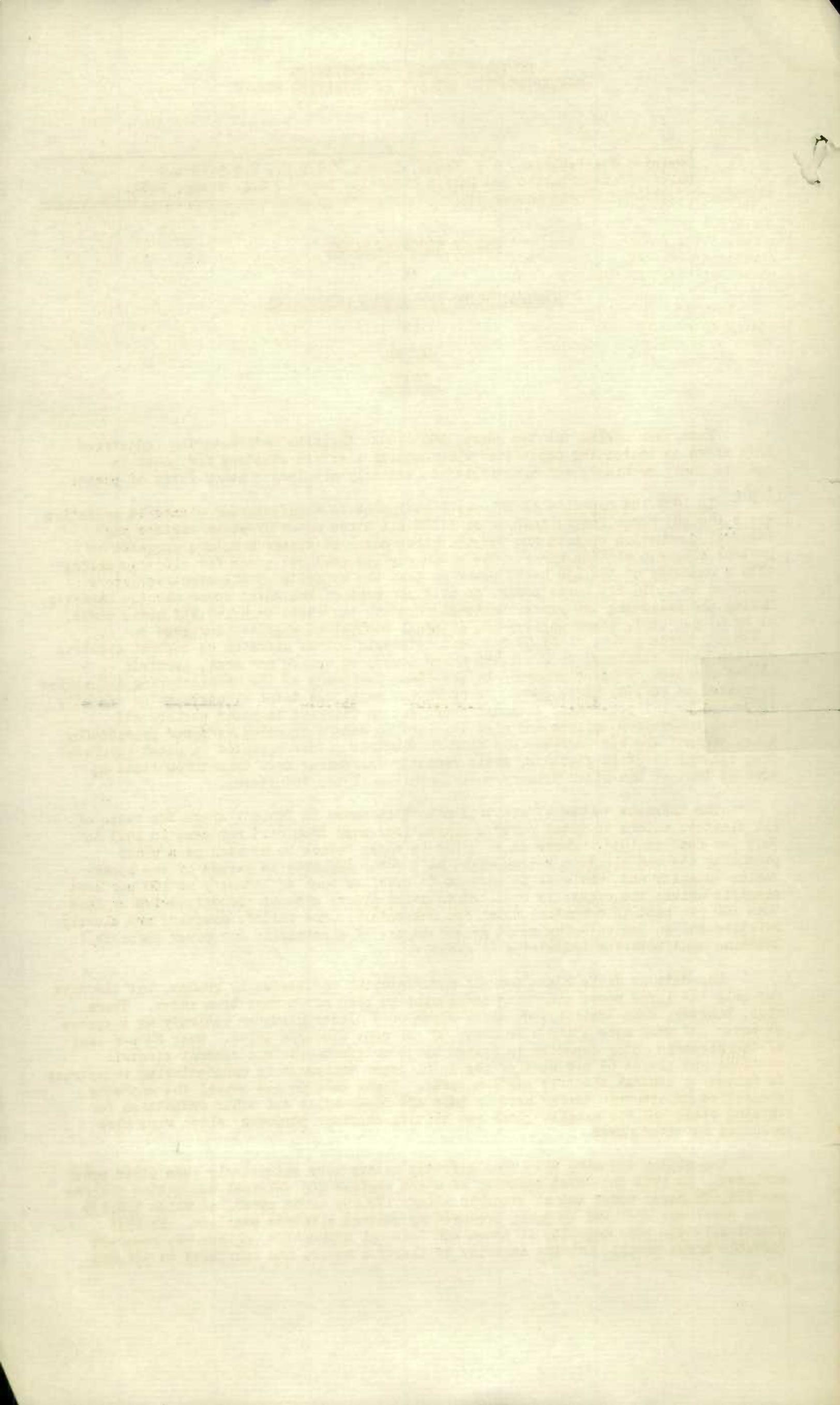
Each year during the ten years, 1923-1933, Canadian manufacturing industries have shown an increasing dependence upon central electric stations for power to operate their machinery and electricity is steadily displacing other forms of power.

In 1923 the capacity of all power equipment in manufacturing plants in operation was 2,146,903 horse power, made up of 1,188,211 horse power of steam engines and internal combustion engines and 958,692 horse power of electric motors operated on central electric station power. The steam engines produced power for electric motors with a capacity of 357,136 horse power so that the capacity of all electric motors amounted to 1,315,828 horse power, or 61.3 per cent of the total power machine capacity. During the following ten years the total capacity increased to 4,147,831 horse power, or by 93 per cent, steam engines and internal combustion engines increased to 1,476,391 horse power, or by 55 per cent, electric motors operated on central electric station power increased to 2,671,440 horse power, or by 179 per cent, electric motors operated on power produced by the steam equipment of the manufacturing industries increased to 502,706 horse power, or by 41 per cent, and total electric motor capacity increased by 141 per cent. Although there was an increase in steam engines and internal combustion engines and also in electric motors operated by power produced by these engines the big increase has been in electric motors operated on power purchased from central electric stations, their capacity increasing more than three times as much as that of the other primary power machines in the industries.

The increase in use of electric motors is shown in Table 1 where the ratio of all electric motors to total power employed increased from 61.3 per cent in 1923 to 76.5 per cent in 1933. There is an error in these ratios in as much as a plant producing its own electric energy might have motor capacity in excess of the steam engine capacity and, while it is correct to consider such an industry as 100 per cent electric drive, the excess is credited to other plants without electric drive or less than 100 per cent in computing total and sub-totals. The ratios, however, are closely relative and do indicate the rapid growth in use of electricity for power purposes in Canadian manufacturing industries as a whole.

The data in Table 2 are for all manufacturing industries by groups, but the data for only the large power consuming industries in each group have been shown. There were, however, many smaller industries which used electric energy entirely as a source of power and many more which were above 90 per cent electric drive. Over 84 per cent of the electric motor capacity is driven by power purchased from central electric stations and almost 65 per cent of the total power equipment in manufacturing industries is driven by central electric station power. These data do not reveal the enormous quantities of electric energy used by pulp and paper mills and other industries for raising steam and for metallurgical and electro-chemical purposes, which were also produced by water power.

The mining industry also uses electric motors more extensively than other power machines. In 1923 the rated capacity of steam engines and internal combustion engines was 128,621 horse power and of electric motors 172,695 horse power, of which 118,835 horse power was operated by power produced by central electric stations. In 1931 practically the same capacity of steam and internal combustion engines was reported (127,812 horse power), but the capacity of electric motors had increased to 392,826



horse power, or by 128 per cent, and the motors operated by central electric energy had a capacity almost 2½ times that of the steam and internal combustion engines.

Table 4 indicates that during the last three years there has been a shift from motors operated by electricity generated in the industries to motors operated by central electric station power, but the total motor capacity has not kept pace with the total power employed, particularly in 1933. The big decrease has been caused by a relatively large increase in steam and internal combustion engines in the fuels comprising the coal, gas and petroleum mining industries and only a small increase in motor capacity, as shown in Table 5.

In previous issues of this report was shown the total production of electric energy by central electric stations for the past year. These data are now being shown on monthly reports issued about the 20th of the following month and consequently are not repeated here.

POWER EQUIPMENT OF ALL MANUFACTURING INDUSTRIES /
IN CANADA

Table 1

S U M M A R Y

Year	: Total : Power : employed : H.P.	: Electric Motors Operated			: Total : motor : capacity : H.P.	: Electric : Power : Per cent : of total : P.C.
		: By central : electric stn. : power : H.P.	: By power : generated in : the industries: : H.P.	: Total : motor : capacity : H.P.		
1923	2,146,903	958,692	357,136	1,315,828	61.3	
1924	2,538,535	1,256,183	398,001	1,654,184	65.2	
1925	2,888,164	1,547,754	434,678	1,982,432	68.6	
1926	3,134,248	1,770,334	392,322	2,162,656	69.0	
1927	3,287,582	1,924,687	386,555	2,311,242	70.3	
1928	3,592,184	2,139,129	457,565	2,596,694	72.3	
1929	3,867,979	2,393,634	496,036	2,889,720	74.7	
1930	4,051,744	2,518,853	478,548	2,997,401	74.0	
1931	4,114,677	2,587,411	539,800	3,127,211	76.0	
1932	4,157,420	2,694,164	516,157	3,210,321	77.2	
1933	4,147,831	2,671,440	502,706	3,174,147	76.5	

/ Excluding central electric stations.

Table 2.

POWER EQUIPMENT OF MANUFACTURING INDUSTRIES/

IN CANADA

1933

Industries	Total Power employed	Electric Motors Operated			Total motor capacity	Electric Power Per cent of total
		By central electric station power	By power generated in the industries	H.P.		
	H.P.	H.P.	H.P.	H.P.	P.C.	
<u>Group 1.- Vegetable Products</u>	326,666	211,859	25,983	237,842	72.81	
Biscuits, confectionery, etc.	21,919	18,062	272	18,334	83.64	
Breweries	23,719	17,700	1,286	18,986	80.05	
Flour and feed mills	123,395	58,890	2,911	61,801	50.08	
Rubber goods, footwear, etc.	62,439	59,276	350	59,626	95.49	
Sugar refineries	21,322	6,642	14,286	20,928	98.15	
<u>Group 2.- Animal Products</u>	112,035	78,951	1,869	80,820	72.14	
Butter and cheese	37,572	24,598	...	24,598	65.47	
Leather tanneries	14,026	10,955	...	10,955	78.10	
Slaughtering & meat packing	32,466	27,418	430	27,848	85.78	
<u>Group 3.- Textiles & Textile Products</u>	215,907	157,225	18,587	175,812	81.43	
Cotton yarn and cloth	105,674	74,122	5,142	79,264	75.01	
Dyeing, cleaning & laundry	14,173	8,995	5,314	14,309	100.00	
Hosiery and knitted goods	18,470	10,228	2,837	13,065	70.74	
Silk and artificial silk	14,234	13,234	872	14,106	99.10	
Woollen cloth	14,079	10,437	50	10,487	74.49	
<u>Group 4.- Wood and Paper Products</u>	2,035,112	1,114,966	343,928	1,458,894	71.69	
Furniture	20,766	10,987	1,399	12,386	59.65	
Planing mills, sash & door	45,452	26,492	710	27,202	59.85	
Printing and publishing	23,881	21,979	646	22,625	94.74	
Pulp and paper	1,612,595	981,553	296,601	1,278,154	79.26	
Saw mills	248,102	14,427	40,794	55,221	22.26	
<u>Group 5.- Iron & Iron Products</u>	626,730	453,021	68,413	521,434	83.20	
Agricultural implements	21,839	18,243	72	18,315	83.86	
Automobiles	38,685	15,519	20,013	35,532	91.85	
Automobile supplies	26,527	24,854	80	24,934	93.99	
Bridge & structural steel	26,810	27,140	...	27,140	100.00	
Castings and forgings	64,385	59,795	671	60,466	93.91	
Machinery	36,028	28,128	2,424	30,552	84.80	
Primary iron and steel	228,189	120,444	33,710	154,154	67.56	
Railway rolling stock	110,947	93,258	6,246	99,504	89.69	
<u>Group 6.- Non-ferrous Metal Products</u>	434,581	337,587	21,833	359,420	82.70	
Brass and copper	21,043	19,555	340	19,895	94.54	
Electrical apparatus & supplies	89,798	76,342	4,937	81,279	90.51	
Non-ferrous metal smelting	314,071	232,021	16,556	248,577	79.15	
<u>Group 7.- Non-metallic Mineral Products</u>	219,612	177,926	13,623	191,549	87.22	
Cement	82,864	75,600	6,882	82,482	99.54	
Clay products (domestic clay)	22,647	16,208	128	16,336	72.13	
Coke and gas products	28,291	21,144	2,172	23,316	82.41	
Petroleum	35,193	18,956	1,977	20,933	59.48	
<u>Group 8.- Chemicals and Chemical Products</u>	110,873	84,587	8,450	93,037	83.91	
Acids, alkalies and salts	53,490	35,063	5,972	41,035	76.72	
Fertilizers	18,930	18,850	...	18,850	99.58	
<u>Group 9.- Miscellaneous Industries</u>	66,315	55,318	20	55,338	83.45	
Ice, artificial	10,556	10,414	...	10,414	98.65	
Ship building and repairs	38,717	31,442	...	31,442	81.21	
<u>Total All Manufacturing Industries /</u>	4,147,831	2,671,440	502,706	3,174,146	76.53	

/ Excluding central electric stations.

Table 3. TOTAL POWER EMPLOYED IN MANUFACTURING INDUSTRIES[†]
IN CANADA
1933

Provinces	: Total : power : employed : H.P.	: Electric Motors Operated			: Electric : Power : Per cent : of : Total : P.C.
		: By central : electric : station : power : H.P.	: By power : generated : in the : industries : H.P.	: Total : motor : capacity : H.P.	
Prince Edward Island	3,521	699	5	704	19.99
Nova Scotia	201,019	93,119	9,196	102,315	50.90
New Brunswick	179,182	94,489	44,071	138,560	77.33
Quebec	1,492,619	1,051,489	91,512	1,143,001	76.57
Ontario	1,632,550	1,086,997	238,542	1,325,539	81.19
Manitoba	90,391	74,883	446	75,329	83.34
Saskatchewan	31,057	18,983	337	19,324	62.22
Alberta	64,519	39,341	2,091	41,432	64.22
British Columbia & Yukon ...	452,973	211,436	116,506	327,942	72.40
CANADA	4,147,831	2,671,440	502,706	3,174,146	76.53

Table 4. POWER EMPLOYED IN THE MINING INDUSTRY^x IN CANADA

Year	: Total : power : employed : H.P.	: Electric Motors			: Total : motor : capacity : H.P.	: Electric : Power : Per cent : of : total : P.C.
		: Operated by : central electric : station power : H.P.	: Operated by : power : generated in : the industry : H.P.	: Total : motor : capacity : H.P.		
1923	301,316	118,835	53,860	172,695	57.3	
1924	314,173	125,725	71,376	197,101	62.7	
1925	323,882	147,191	64,126	211,317	65.2	
1926	336,880	167,241	64,277	231,518	68.7	
1927	380,460	202,702	62,067	264,769	69.6	
1928	419,464	223,666	68,121	291,787	69.6	
1929	450,261	238,974	75,069	314,043	69.7	
1930	509,007	297,826	88,585	386,411	75.9	
1931	520,638	313,567	79,259	392,826	75.5	
1932	482,344	287,130	76,626	363,756	75.4	
1933	533,779	322,361	47,407	369,768	69.3	

Table 5. POWER EMPLOYED IN THE MINING INDUSTRY IN CANADA
1933

Industry	: Total : power : employed : H.P.	: Electric Motors Operated			: Total : motor : capacity : H.P.	: Electric : Power : Per cent : of total : P.C.
		: By central : electric stn: : power : H.P.	: By power : generated in : the industry : H.P.	: Total : motor : capacity : H.P.		
Metal mining	224,174	161,910	23,116	185,026	82.54	
Non-metal mining	58,098	50,374	2,100	52,474	90.32	
Sand, gravel and stone	41,684	30,199	826	31,025	74.43	
Fuels	209,823	79,878	21,365	101,243	48.25	
TOTAL MINING ^x	533,779	322,361	47,407	369,768	69.27	

† Excluding central electric stations.

x Excluding non-ferrous smelting, salt, cement, clay products and lime.

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