

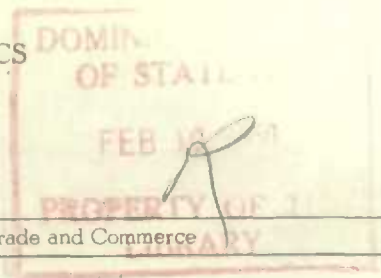
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USE OF ELECTRIC POWER IN MANUFACTURING AND MINING INDUSTRIES

CANADA, 1947

The purpose of this report is to show the evolution since 1925 of power machinery in manufacturing and mining industries in Canada toward electric drive and particularly toward electric motors driven by power generated in central stations. With no coal mined in the chief manufacturing provinces of Ontario and Quebec and with a large supply of water power within economic transmission distances of manufacturing and mining centres in these and in most of the other provinces, this trend has been more pronounced than in most other countries. The trend has been measured by the ratio of electric motor capacity to total power equipment installed in these industries, the central electric station industry being excluded as one of the manufacturing industries.

This ratio of electric motor rating to total power equipment indicates the evolution, but the movement towards electric drive is slightly exaggerated because of the practice in mills, factories, shops, etc., of installing motors at each machine or group of machines with a total capacity greater than would be necessary if only one large motor were used or if a steam engine and belts and shafting were used. Also there are some industries which require steam in their manufacturing processes, and consequently use steam engines as their primary power equipment. Some of these are a hundred per cent electrified and some are not. Other industries use direct hydraulic drive such as ground wood pulp mills. In such industries it is probable that electric motors will never supplant other forms of power equipment.

In the early annual industrial censuses no segregation was made of electric motors operated on power purchased from central electric stations and on power produced within the establishment making the report. Consequently, 1925 is the first year for which total power employed can be compiled without duplication.

During the twenty-four years from 1925 to 1947 there has been a steady increase in total capacity of power equipment in manufacturing and mining industries, and electric motors driven by central station power, which constitute some 70 per cent of the total power capacity, rose by 445 per cent. The capacity of water wheels increased only 39 per cent, the majority of new installations being in central electric stations. Steam engines also showed a relatively small increase compared to the advance in total power and although internal combustion engines increased in capacity ten fold, they still constitute only 7.0 per cent of the total capacity. These include both diesel or compression ignition engines and electric ignition engines.

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Electric motors driven by current generated in the manufacturing industries showed a small decrease in 1947 from the 1946 capacity, while in the mining industries an increase of 13 per cent was recorded over the preceding year.

The following table shows the rated capacity in horse power of all power equipment in manufacturing and mining industries in 1925 and 1947. These include equipment in regular use and idle or reserve equipment in operating industries.

	Capacity (Horse Power)		Increase	
	1925	1947	H. P.	P. C.
<u>Manufacturing Industries</u>				
Water Wheels	587,191	798,461	211,270	36.0
Steam Engines	554,191	1,047,838	493,647	89.1
Internal Combustion Engines	46,829	453,304	406,475	868.0
Total	1,188,211	2,299,603	1,111,392	93.5
Electric Motors on Purchased Power	958,692	5,099,566	4,140,874	431.9
Total Power	2,146,903	7,399,169	5,252,266	244.6
Electric Motors on Power Generated in the Industries	357,136	804,064	446,928	125.1
Total Electric Motors	1,315,828	5,903,630	4,587,802	348.7
<u>Mining Industries</u>				
Water Wheels	27,528	55,987	28,459	103.4
Steam Engines	148,039	82,540	- 65,499	- 44.2
Internal Combustion Engines	6,914	139,122	132,208	1,912.2
Total	182,481	277,649	95,168	52.2
Electric Motors on Purchased Power	118,835	775,875	657,040	552.9
Total Power	301,316	1,053,524	752,208	249.6
Electric Motors on Power Generated in the Industries	53,860	96,938	43,078	80.0
Total Electric Motors	172,695	872,813	700,118	405.4
<u>Manufacturing and Mining Industries</u>				
Water Wheels	614,719	854,448	239,729	39.0
Steam Engines	702,230	1,130,378	428,148	61.0
Internal Combustion Engines	53,743	592,426	538,683	1,002.3
Total	1,370,692	2,577,252	1,206,560	88.0
Electric Motors on Purchased Power	1,077,527	5,875,441	4,797,914	445.3
Total Power	2,448,219	8,452,693	6,004,474	245.3
Electric Motors on Power Generated in the Industries	410,996	901,002	490,006	119.2
Total Electric Motors	1,488,523	6,776,443	5,287,920	355.2

The ratio of electric motor capacity to total power employed in manufacturing industries has increased fairly steadily, the few recessions being less than one point up to 1943 when the decline was from 81.7 to 80.7 per cent. Commencing with 1935, data were gathered on spare or idle equipment. For each of the years 1935-1945, the percentage of total equipment not in regular use was around 6 to 8 per cent but in 1946 there was considerable idle equipment in aluminium plants and plants previously producing explosives and other munitions of war, and consequently the idle equipment increased to 8.8 per cent for all manufacturing industries, and as high as 25.5 per cent for the non-ferrous metal products group. However, in 1947 idle equipment decreased to 7.7 per cent for all manufacturing industries, and dropped to 16.0 per cent for the non-ferrous metal products group as the post war recovery got under way. The index of industrial production rose from 159.2 in 1946 to 175.5 for 1947.

Table 3 indicates that while the transfer to electric drive from other forms of power has been taking place in all groups of industries, many of them were highly electrified in 1923.

The power employed in the pulp and paper industry is by far the greatest of any industry, constituting 35 per cent of the total for all manufacturing industries in 1923 and the same percentage in 1947.

In previous years the consumption of electricity by the pulp and paper mills was an even larger percentage of the total consumption, but with the increasing requirement of primary power for the wartime aluminium industry and other electro-metallurgical and electro-chemical industries the pulp and paper's percentage dropped from 39.8 in 1941 to 27 in 1943 but rose to 41 p.c. in 1945, to 48 p.c. in 1946 and returned to 41 p.c. in 1947.

Table 4 shows the power equipment in regular use in manufacturing plants operating during 1947. The data in this table differ from those shown in reports prior to 1936 in that idle equipment is excluded here except for the group totals where totals both including and excluding idle equipment are shown. Under each group are shown only the industries having large power installations. Many other industries not listed use electric drive almost exclusively. The consumption of electricity is also shown for each industry listed. This is broken down into "purchased from central stations" and "generated by the industries". The former is also divided between that used for lighting and power purposes and for other purposes, which includes electricity used in electric furnaces, electric boilers, electro-chemical processes, etc. Electric boilers, particularly in pulp and paper mills, took the major portion of this class of electricity in years prior to 1940, and in most cases it was surplus or off-peak power that was purchased for this purpose. The total consumption for these other purposes in 1947 was 14,083,535,000 kw.hrs. of purchased power, or 53 per cent of the total quantity purchased. A portion of the power generated in the industries also is used for other than lighting and driving machines but a comprehensive breakdown is not available. Changes in group classifications made in 1947 somewhat affect comparability. Synthetic rubber was transferred from Vegetable Products to Chemical, mattresses and springs from Miscellaneous to furniture under the Wood and Paper group and part of plastics industry to Miscellaneous from the Chemical products group.

The mining industries are practically as highly electrified as the manufacturing industries, the ratio increasing from 57.3 per cent in 1923 to 82.8 per cent in 1947. Data for the mining industries are shown in Tables 2 and 7.

The fuels group showed an increase in capacity of motors operated on purchased power from 10,055 h.p. in 1923 to 139,243 h.p. in 1947 as compared with a decrease from 37,308 to 21,649 h.p. in motors operated by

power generated by the coal mines and gas and oil wells. These industries apparently have found it more economical to purchase electricity than to produce it themselves and also more advantageous than to use steam engines.

Table 8 brings together, by groups of manufacturing industries, the number of employees on salaries and on wages, and the h.p. ratings of all power equipment, including both active and idle, and from these data the average horse power equipment per employee has been computed.

The rising averages up to 1939 indicate in a general way a substitution of mechanical power for manpower or, in other words, they indicate an increasing productive capacity per employee. The number of employees fluctuate more quickly than installed power equipment capacities. Thus, the reduction of employees in 1933 did not have a corresponding reduction in power equipment, and consequently the average horse power per employee showed an increase out of line with the trend.

The downward trend of these averages during the war years was undoubtedly due to the increased employment of night shifts resulting in a greater use per 24 hours of the power equipment. This is indicated by an increased consumption of electricity for power and lighting per horse power of electric motors. On an employee basis most of the industries consumed slightly less electricity. However, with the closing down of many war plants in the last half of 1945, peacetime patterns were restored in several industrial groups, and in 1947 the average consumption of electricity per employee increased slightly over 1946.

A survey of the average power equipment capacity per employee indicates the caution which should be taken when using these averages. The average for all industries during the industrial depression was 8.7 h.p., whereas for 1947 when industrial activity was on a very high level it was only 6.5 h.p., and when idle equipment is eliminated it was only 6.0 h.p., despite an increase in the total capacity of 78 per cent. Of course, the hours use per day or per year of the power equipment is a very important factor. Thus, doubling the shifts without any change in equipment would reduce the average about 50 per cent. This large amount of mechanical power for each employee or per 100 of population is undoubtedly one of the most important factors contributing to the high standard of living in Canada.

Canada excels all other major manufacturing and mining nations in the application of electric horse power per employee. The pulp and paper and aluminium industries, particularly, could not prosper without vast supplies of cheap hydro electric power. At the end of 1948 the water power capacity developed in Canada was placed at 10,870,718 horse power which represented but 21 p.c. of the recorded water power resources of the nation.

Table 1

POWER EQUIPMENT OF ALL MANUFACTURING INDUSTRIES IN CANADA

Year	S U M M A R Y				
	Total Power Employed	Electric Motors Operated			Electric Power Per Cent of Total
		By Central Electric Stn. Power	By Power Generated in the Industries	Total Motor Capacity	
	H.P.	H.P.	H.P.	H.P.	P.C.
1923	2,146,903	958,692	357,136	1,515,828	61.3
1929	3,867,979	2,393,684	496,036	2,889,720	74.7
1931	4,114,677	2,587,411	539,800	3,127,211	76.0
1933	4,147,851	2,671,440	502,706	3,174,147	76.5
1935	4,346,775	2,874,693	512,396	3,387,089	77.9
1937	4,712,279	3,129,790	602,955	3,732,745	79.2
1939	5,056,357	3,375,169	694,450	4,069,619	80.5
1940	5,290,935	3,563,048	724,769	4,287,817	81.1
1941	5,850,076	4,028,942	740,112	4,769,054	81.6
1942	5,969,895	4,076,277	800,917	4,877,194	81.7
1943	6,415,851	4,420,105	760,630	5,180,735	80.7
1944	6,468,439	4,437,296	779,717	5,217,013	80.7
1945	6,606,651	4,586,636	787,930	5,374,566	81.4
1946	6,783,949	4,649,993	820,371	5,470,364	80.6
1947	7,399,169	5,099,566	804,064	5,903,630	80.0

^ Excluding central electric stations and including idle & reserve equipment.

Table 2

POWER EMPLOYED IN THE MINING INDUSTRY¹ IN CANADA

Year	Total Power Employed	Electric Motors			Electric Power P. C. of Total
		Operated by Central Electric Station Power	Operated by Power Generated in the Industry	Total Motor Capacity	
	H.P.	H.P.	H.P.	H.P.	P.C.
1923	501,516	118,855	53,360	172,695	57.5
1924	514,175	125,725	71,576	197,101	62.7
1925	525,882	147,191	64,126	211,517	65.2
1926	556,880	187,241	84,277	231,518	68.7
1927	580,460	202,702	62,067	264,769	69.6
1928	419,464	225,666	68,121	291,787	69.6
1929	450,261	258,974	75,089	314,043	69.7
1930	509,007	297,826	88,585	386,411	75.9
1931	520,658	513,567	79,259	392,826	75.5
1932	482,544	287,130	76,626	365,756	75.4
1933	535,779	322,561	47,407	369,768	69.3
1934	621,071	400,035	66,647	466,682	75.1
1935	688,470	446,247	74,687	520,934	75.7
1936	724,639	474,000	79,140	553,140	76.3
1937	850,489	577,703	101,526	678,229	79.7
1938	874,943	582,510	89,568	671,878	78.8
1939	1,015,200	712,311	101,740	814,051	80.2
1940	1,061,840	746,777	101,606	848,383	79.9
1941	1,113,042	749,126	106,501	855,627	76.9
1942	1,008,777	672,097	118,748	790,845	78.4
1943	988,457	695,109	105,436	800,545	81.0
1944	975,185	687,652	86,558	774,210	79.4
1945	987,595	708,775	90,142	798,917	80.9
1946	1,010,013	746,669	85,427	832,096	82.4
1947	1,053,524	775,875	96,958	872,813	82.8

¹ Excluding non-ferrous smelting, salt, cement clay products and lime, included with "Manufacturing".

Table 3

SUMMARY OF POWER EMPLOYED IN MANUFACTURING INDUSTRIES

(Including Idle and Reserve Equipment)

Manufacturing Industries	1923		1945		1946		1947	
	Power		Power		Power		Power	
	Total H.P.	Per cent Electric Motor	Total H.P.	Per cent Electric Motor	Total H.P.	Per cent Electric Motor	Total H.P.	Per cent Electric Motor
1. Vegetable Products	257,176	65	528,605	75	554,499	76	551,602	85
2. Animal Products	80,895	72	197,221	81	212,634	82	226,385	84
3. Textile Products	107,850	83	285,862	91	301,585	92	319,546	92
4. Wood & Paper Products	1,146,571	50	2,987,455	74	3,313,788	74	3,526,379	75
5. Iron and its "	213,705	89	1,244,225	91	1,192,471	91	1,343,565	88
6. Non-ferrous Metal "	99,963	47	636,900	92	555,693	89	600,455	94
7. Non-metallic Mineral Products	151,780	85	318,121	81	332,016	81	354,069	80
8. Chemical & Allied "	62,447	72	371,555	92	284,990	91	457,248	61
9. Miscellaneous	48,516	86	56,747	99	56,273	98	59,920	98
TOTAL	2,146,905	61	6,606,651	81	6,785,949	81	7,399,169	80

Table 4

POWER EQUIPMENT OF MANUFACTURING INDUSTRIES IN CANADA, 1947

(Equipment in Regular Use)

Industry	Total Capacity of Power Equipment	Electric Motors Operated			Ratio of Motor to Total Power	Consumption of Electricity			
		By Central Electric Station Power	By Power Generated in the Industries	Total Motor Capacity		Purchased from Central Electric Stations for		Generated by the Industries for own use	Total Consumption
						Power and Lighting	Other Purposes		
	A H.P.	B H.P.	C H.P.	D H.P.	E P.C.	F	G	H	I
GROUP 1. VEGETABLE PRODUCTS x	531,802	408,606	41,182	449,788	84.58				
	490,716	380,077	36,920	416,997	84.98	675,667	56,825	27,173	739,663
Biscuits, confectionery, etc.	26,887	24,962	840	25,802	95.96	51,353	3	414	51,770
Bread and bakery products	22,555	21,172	-	21,172	94.79	42,586	22	-	42,608
Breweries	29,785	25,770	424	26,194	87.94	49,984	-	881	50,865
Flour and feed mills	125,282	81,090	983	82,073	65.51	186,759	2	2	186,763
Food stock and poultry	36,410	33,757	-	33,757	92.71	44,119	-	-	44,119
Fruit and Vegetable preparations	42,930	29,139	1,373	30,512	71.07	22,773	87	-	22,860
Rubber goods, footwear, etc.	98,293	91,258	1,908	93,166	94.78	174,078	56,486	1,555	212,119
Sugar refineries	51,924	9,391	21,992	31,383	98.31	12,682	-	18,169	30,851
GROUP 2. ANIMAL PRODUCTS x	226,385	185,577	3,809	189,386	83.66				
	210,487	174,484	3,659	178,143	84.63	276,171	5,191	4,218	285,580
Butter and cheese	53,361	45,215	156	45,371	85.03	62,802	215	11	63,028
Fish curing and packing	27,926	12,313	1,669	13,982	50.07	12,858	2,370	1,592	16,820
Leather tanneries	21,745	19,244	788	20,032	92.12	25,698	14	-	25,712
Slaughtering and meat packing	69,027	63,445	53	63,498	91.99	121,896	472	-	122,368
GROUP 3. TEXTILES AND TEXTILE PRODUCTS x	519,346	263,976	30,048	294,024	92.07				
	294,787	248,812	27,759	276,571	93.82	532,460	39,845	63,492	635,797
Cotton yarn and cloth	113,209	93,526	10,909	104,435	92.25	215,789	12,216	18,381	246,386
Hosiery and knitted goods	23,542	17,946	1,647	19,593	83.23	35,438	111	3,931	39,480
Silk and artificial silk	49,863	39,290	8,370	47,660	95.58	141,834	27,450	26,112	195,396
Woollen cloth	24,395	22,245	448	22,693	93.02	32,010	31	1,586	33,627
GROUP 4. WOOD & PAPER PRODUCTS x	3,526,379	2,020,649	606,795	2,627,444	74.51				
	3,312,599	1,910,499	570,273	2,480,772	74.89	6,857,570	3,489,748	2,427,629	12,774,947
Furniture	54,597	46,285	3,500	49,785	91.19	38,075	37	2,754	40,866
Planing mills, sash and door	87,893	53,060	4,870	57,930	65.91	38,044	12	4,323	42,379
Printing and publishing	29,661	29,137	747	29,884	100.00	45,163	2,234	80	47,477
Pulp and paper	2,364,649	1,571,526	477,707	2,049,233	86.66	6,487,951	3,484,754	2,516,376	12,289,081
Saw mills	613,757	77,493	75,148	152,641	24.87	73,442	263	92,262	165,967

<u>GROUP 5. IRON AND ITS PRODUCTS</u> x	1,343,565	1,112,512	64,468	1,176,980	87.60					
	1,244,030	1,058,998	63,126	1,122,124	90.20	1,269,321	1,233,348	186,960	2,689,629	
Agricultural implements	43,605	38,250	230	38,480	88.25	52,885	-	-	52,885	
Aircraft	15,271	15,271	-	15,271	100.00	31,779	-	-	31,779	
Automobiles	74,023	27,075	38,902	65,977	89.13	39,483	-	77,284	116,767	
Automobile supplies	79,116	78,765	1	78,766	99.56	93,209	17,346	-	110,555	
Bridge and structural steel	44,672	41,974	-	41,974	93.96	22,934	-	-	22,934	
Castings, iron	76,385	74,104	1,014	75,118	98.34	78,267	3,974	26	82,267	
Hardware, tools and cutlery	48,224	47,763	180	47,943	99.42	44,838	915	2	45,755	
Iron and steel products	39,909	38,530	180	38,710	97.00	39,632	-	-	39,632	
Machinery	98,942	93,338	292	93,630	94.63	82,715	2,335	135	85,185	
Primary iron and steel	361,176	278,859	9,437	288,296	79.82	441,627	1,165,414	101,212	1,708,253	
Railway rolling stock	138,985	124,780	5,872	130,652	94.00	108,579	33,900	2,451	144,930	
Sheet metal products	38,429	37,239	583	37,822	98.42	50,536	3,870	6	54,412	
Shipbuilding and repairs	94,135	80,844	416	81,260	86.32	63,125	-	254	63,379	
<u>GROUP 6. NON-FERROUS METAL PRODUCTS</u> x	600,455	555,489	11,535	567,024	94.43					
	504,356	474,892	8,343	483,235	95.81	1,060,151	6,852,873	568,641	8,481,665	
Aluminium products	33,733	33,518	-	33,518	99.36	49,947	82,274	-	132,221	
Brass and copper products	44,843	44,352	-	44,352	98.91	45,645	19,037	-	64,682	
Electrical apparatus and supplies	125,877	114,423	1,992	116,415	92.48	175,583	6,346	16,037	197,966	
Non-ferrous metal smelting & refining	274,059	257,155	6,351	263,506	96.15	758,409	6,744,744	552,604	8,055,757	
<u>GROUP 7. NON-METALLIC MINERAL PRODUCTS</u> x	354,069	270,999	10,588	281,587	79.53					
	308,479	237,383	9,890	247,273	80.16	577,349	1,089,529	25,872	1,692,750	
Cement	84,381	80,066	1,008	81,074	96.08	220,989	-	725	221,714	
Clay products - domestic clay	23,717	15,003	233	15,236	64.24	22,625	519	1,240	24,384	
Coke and gas products	33,688	21,838	3,945	25,783	76.53	51,849	9,435	8,791	70,075	
Petroleum products	72,217	37,880	288	38,168	52.85	118,265	-	547	118,812	
<u>GROUP 8. CHEMICALS AND CHEMICAL PRODUCTS</u> x	457,248	244,900	33,270	278,170	60.84					
	427,314	219,729	30,836	250,565	58.64	1,318,983	1,337,662	158,033	2,814,678	
Acids, alkalies and salts	89,508	64,062	11,309	75,371	84.21	124,656	1,232,920	109,007	1,466,583	
Fertilizers	197,906	87,479	-	87,479	44.20	1,078,698	-	3,647	1,082,345	
<u>GROUP 9. MISCELLANEOUS INDUSTRIES</u> x	39,920	36,858	2,369	39,227	98.26					
	37,652	35,671	1,912	37,583	99.82	77,032	516	5,517	83,065	
Ice, artificial	13,865	13,815	-	13,815	99.64	44,072	360	2,960	47,392	
<u>TOTAL ALL INDUSTRIES - 1947</u> x	7,399,169	5,099,566	804,064	5,903,630	79.79					
	6,830,420	4,740,545	752,718	5,493,263	80.42	12,644,704	14,083,535	3,467,535	30,195,774	
<u>1946</u> x	6,783,949	4,649,993	820,371	5,470,564	80.64					
	8,189,576	4,311,762	775,750	5,087,512	82.19	11,808,278	13,442,598	2,714,262	27,965,138	

x - Including equipment idle or reserve. These totals are comparable with data in reports prior to 1936.
(See text, page 3, for minor changes in classifications in 1947)

Table 5

POWER EMPLOYED IN MANUFACTURING INDUSTRIES, BY PROVINCES, 1947

(In Regular Use)

Provinces	Total Power Employed	Electric Motors Operated			Electric Power Per Cent of Total	Consumption of Electricity			
		By Central Electric Station Power	By Power Generated in the Industries	Total Motor Capacity		Purchased from Central Electric Stations		Generated by the Industries for own use	Total
						For Power and Lighting	For Other Purposes		
	H.P.	H.P.	H.P.	H.P.		(Thousands of Kilowatt Hours)			
Prince Edward Island	6,627	1,543	1	1,544	23.3	1,292	11	-	1,303
Nova Scotia	249,610	142,175	14,084	156,259	62.6	226,248	1,613	108,151	336,012
New Brunswick	253,577	140,590	51,886	192,476	75.9	377,315	4,129	231,731	613,175
Quebec	2,365,193	1,852,374	159,840	2,012,214	85.1	5,959,285	10,651,580	750,984	17,341,849
Ontario	2,780,902	2,032,620	352,100	2,384,720	85.8	4,238,195	2,946,813	1,355,336	8,540,344
Manitoba	187,071	160,010	4,080	164,090	87.7	363,649	270,967	7,569	642,185
Saskatchewan	64,321	35,079	227	35,306	54.9	107,776	133,034	349	241,159
Alberta	153,167	93,593	5,616	99,209	64.8	257,697	709	7,812	266,218
British Columbia	769,393	282,537	164,884	447,421	58.2	1,113,211	94,679	1,005,603	2,213,493
Yukon & N.W. Territories	559	24	-	24	4.3	36	-	-	36
Total	6,830,420	4,740,545	752,718	5,493,263	80.4	12,644,704	14,083,535	3,467,535	30,195,774
<u>Including Idle and Reserve Equipment</u>									
Prince Edward Island	7,106	1,672	1	1,673	23.5				
Nova Scotia	262,170	146,928	14,594	161,522	61.6				
New Brunswick	286,309	153,703	58,038	211,741	74.0				
Quebec	2,566,894	2,013,303	172,748	2,186,051	85.2				
Ontario	3,013,815	2,161,614	377,916	2,539,530	84.3				
Manitoba	202,911	172,187	5,262	177,449	87.5				
Saskatchewan	70,473	37,763	227	37,990	53.9				
Alberta	166,169	100,874	6,215	107,089	64.4				
British Columbia	822,703	311,498	169,063	480,561	58.4				
Yukon & N.W. Territories	619	24	-	24	3.9				
Total	7,399,169	5,099,566	804,064	5,903,630	79.8				

Table 6

POWER EQUIPMENT
IN REGULAR USE AND TOTAL INCLUDING IDLE AND RESERVE EQUIPMENT, 1947

MANUFACTURING INDUSTRIES

Industry	TOTAL POWER EMPLOYED		ELECTRIC MOTORS OPERATED BY						Ratio of Motor to Total Power		CONSUMPTION OF ELECTRICITY			
	In Regular Use	Incl. Idle & Reserve Equipment	Central Station Power		Power Generated in the Industries		Total		In Regular Use	Incl. Idle & Reserve	Purchased from Central Electric Stations		Generated by the Industries for own use	Total
			In Regular Use	Incl. Idle & Reserve	In Regular Use	Incl. Idle & Reserve	In Regular Use	Incl. Idle & Reserve			For Power & Lighting	For Other Purposes		
	A	B	C	D	E	F	G	H	I	J	K L M N			
H.P.	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.	P.C.	P.C.	(Thousands of Kilowatt Hours)				
1. Vegetable Products	490,716	551,802	380,077	408,606	36,920	41,182	416,997	449,788	84.98	84.58	675,667	36,823	27,175	739,665
2. Animal Products	210,487	226,585	174,484	185,577	3,659	3,809	178,143	189,386	84.63	85.66	276,171	3,191	4,218	283,580
3. Textiles and Textile Products	294,787	519,346	248,812	265,976	27,759	30,048	276,571	294,024	95.82	92.07	552,460	39,845	65,492	635,797
4. Wood & Paper	5,512,599	5,526,579	1,910,499	2,020,649	570,273	606,795	2,480,772	2,627,444	74.89	74.51	6,857,570	3,489,748	2,427,629	12,774,947
5. Iron and its	1,244,030	1,345,565	1,058,998	1,112,512	83,126	64,468	1,122,124	1,176,980	90.20	87.60	1,269,321	1,233,348	186,960	2,689,629
6. Non-ferrous Metal Products	504,556	600,455	474,892	555,489	8,543	11,535	483,235	567,024	95.81	94.43	1,060,151	6,852,873	508,641	8,481,665
7. Non-metallic Mineral Products	508,479	354,069	237,585	270,999	9,890	10,588	247,275	281,587	80.26	79.53	577,349	1,089,529	25,872	1,632,750
8. Chemicals and Chemical Products	427,514	457,248	219,729	244,900	30,836	33,270	250,565	278,170	58.64	60.84	1,518,983	1,337,662	158,033	2,814,678
9. Miscellaneous Industries	37,652	59,920	35,671	36,858	1,912	2,369	37,583	39,227	99.82	98.26	77,032	516	5,517	83,065
Total - 1947	8,830,420	7,399,169	4,740,545	5,099,566	752,718	804,064	5,493,263	5,903,630	80.42	79.79	12,644,704	14,085,535	3,467,535	30,195,774
- 1946	6,189,576	6,783,949	4,311,762	4,649,993	775,750	820,371	5,087,512	5,470,364	82.19	80.64	11,808,278	13,442,598	2,714,262	27,965,138
Per cent change	+ 10.35	+ 9.07	+ 9.94	+ 9.67	- 2.97	- 1.99	+ 7.98	+ 7.92			+ 7.08	+ 4.77	+ 27.75	+ 7.98

Table 7

MINING INDUSTRIES

Metal Mining	551,081	605,437	441,190	493,814	45,213	68,964	486,403	562,778	91.59	92.95	1,359,428	75,311	202,153	1,636,892
Non-metal Mining	121,445	132,087	94,868	102,158	4,237	5,009	99,105	107,167	81.61	81.13	202,397	1,832	12,169	216,398
Sand, Gravel & Stone	61,465	69,650	34,690	40,660	1,516	1,516	36,006	41,978	58.58	60.27	42,333	-	877	43,210
Fuels	225,580	246,350	132,445	139,243	21,022	21,649	153,467	160,892	68.09	65.31	170,146	-	54,213	224,359
Total - 1947	959,567	1,053,524	703,193	775,875	71,788	96,938	774,981	872,813	82.50	82.85	1,774,304	77,143	269,412	2,120,859
- 1946	906,941	1,010,013	686,505	746,669	73,303	85,427	759,808	832,096	85.78	82.38	1,674,702	65,146	199,950	1,939,798
Per cent change	+ 5.58	+ 4.31	+ 2.43	+ 3.91	- 2.07	+ 13.47	+ 2.00	+ 4.89			+ 5.95	+ 18.42	+ 34.74	+ 9.33

Totals Tables 6 & 7

MANUFACTURING AND MINING INDUSTRIES

1947	7,789,787	8,452,693	5,443,738	5,875,441	824,506	901,002	6,268,244	6,776,443	80.67	80.17	14,419,008	14,160,678	3,736,947	32,316,633
1946	7,096,517	7,793,962	4,998,267	5,396,662	849,053	905,798	5,847,320	6,302,460	82.40	80.86	13,482,980	13,507,744	2,914,212	29,904,938
Per cent change	+ 9.49	+ 8.45	+ 8.91	+ 8.87	- 2.89	- 0.53	+ 7.20	+ 7.52			+ 6.94	+ 4.83	+ 28.23	+ 8.05

Table 8

MANUFACTURING INDUSTRIES
TOTAL POWER EQUIPMENT - TOTAL EMPLOYEES
 Average Horse power per Employee

	1925	1933	1935	1937	1939	1941	1942	1943	1944	1945	1946	1947
<u>Power Employed - H.P.</u>												
1. Vegetable Products	257,176	326,666	331,561	347,002	364,195	402,441	405,076	414,953	508,073	528,605	554,499	531,802
2. Animal "	80,895	112,055	122,560	133,647	145,931	163,917	165,682	179,322	189,159	197,221	212,634	226,385
3. Textiles & Textile Prods.	107,850	215,907	240,549	211,729	234,597	251,916	258,670	266,834	277,304	285,862	301,585	319,346
4. Wood & Paper Products	1,146,571	2,055,112	2,160,085	2,420,436	2,579,463	2,772,081	2,742,314	2,766,491	2,845,242	2,987,455	3,313,788	3,526,379
5. Iron and its "	213,705	626,730	660,491	719,265	730,594	963,548	1,056,870	1,209,202	1,260,802	1,244,225	1,192,471	1,343,565
6. Non-ferrous Metal "	99,963	434,581	416,927	472,031	549,120	673,480	656,415	701,970	656,664	656,900	555,693	600,455
7. Non-metallic Mineral Products	131,780	219,612	222,555	239,898	257,731	285,820	289,332	314,221	316,177	318,121	352,016	354,089
8. Chemicals & Allied "	62,447	110,873	130,464	141,755	158,300	302,746	354,314	525,762	377,448	371,535	284,990	457,248
9. Miscellaneous Industries	46,516	66,315	61,785	26,520	27,361	34,127	32,107	37,096	37,570	36,747	36,273	39,920
Total	2,146,903	4,147,851	4,346,775	4,712,285	5,047,292	5,850,076	5,969,895	6,415,851	6,468,439	6,606,651	6,783,949	7,399,169
<u>Employees</u>												
1. Vegetable Products	65,395	73,095	79,285	94,258	99,447	113,753	115,476	117,243	130,679	135,311	137,170	144,290
2. Animal Products	61,517	53,111	60,124	67,996	69,358	82,131	87,058	88,037	94,195	98,267	102,844	102,106
3. Textiles & Textile Prods.	92,669	106,235	120,699	121,677	121,022	156,892	165,478	157,987	153,122	158,148	164,737	176,065
4. Wood & Paper Products	128,404	105,471	123,724	147,254	144,782	179,967	186,106	183,865	189,674	199,373	224,121	248,450
5. Iron and its "	88,071	70,947	95,426	127,148	121,041	253,701	360,845	435,744	411,944	321,719	249,279	263,482
6. Non-ferrous Metal "	21,409	25,273	33,613	44,614	44,563	73,450	90,937	109,522	104,314	88,350	84,853	96,080
7. Non-metallic Mineral Products	24,978	19,296	23,342	23,837	23,026	28,829	30,707	30,994	31,590	32,525	36,493	39,212
8. Chemicals & Allied "	15,149	15,397	18,933	21,968	22,595	54,014	93,030	92,288	81,822	60,723	37,278	38,491
9. Miscellaneous Industries	16,581	10,361	12,270	11,699	12,280	18,441	22,474	25,368	25,542	24,956	21,381	23,574
Total	514,173	479,186	567,416	660,451	658,114	961,178	1,152,091	1,241,068	1,222,882	1,119,372	1,058,156	1,131,750
<u>Average Horse power of Equipment in Manufacturing Industries per Employee</u>												
1. Vegetable Products	3.9	4.5	3.9	3.7	3.7	3.5	3.5	3.5	3.9	3.9	4.0	3.7
2. Animal Products	1.3	2.1	2.0	2.0	2.1	2.0	1.9	2.0	2.0	2.0	2.1	2.2
3. Textiles & Textile Prods.	1.2	2.0	1.9	1.7	1.9	1.6	1.6	1.7	1.8	1.8	1.8	1.8
4. Wood & Paper Products	8.9	19.3	16.8	16.4	17.8	15.4	14.7	15.1	15.0	15.0	14.8	14.2
5. Iron and its "	2.4	8.8	6.3	5.7	6.0	3.8	2.9	2.8	3.1	3.9	4.8	5.1
6. Non-ferrous Metal "	4.7	17.2	12.5	10.6	12.3	9.2	7.2	6.4	5.3	7.2	6.5	6.2
7. Non-metallic Mineral Products	5.3	11.4	10.8	10.1	11.2	9.9	3.4	10.1	10.0	9.8	9.1	9.0
8. Chemicals & Allied "	4.1	7.2	6.9	6.5	7.0	5.6	3.8	5.7	4.6	6.1	7.6	11.9
9. Miscellaneous Industries	2.8	6.4	2.6	2.3	2.2	1.9	1.4	1.5	1.5	1.5	1.7	1.7
Total	4.2	8.7	7.5	7.1	7.7	6.1	5.2	5.2	5.3	5.9	6.4	6.5

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