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USE OF ELECTRIC POWER

IN

MANUFACTURING AND MINING INDUSTRIES

IN

CANADA

1945



OTTAWA
1948

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DOMINION BUREAU OF STATISTICS
TRANSPORTATION AND PUBLIC UTILITIES DIVISION
OTTAWA

Dominion Statistician, HERBERT MARSHALL
Director, Transportation and Public Utilities Division, G.S.Wrong

USE OF ELECTRIC POWER
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MANUFACTURING AND MINING INDUSTRIES
IN CANADA
1945

20-1920

This report endeavours to show the evolution since 1923 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 many 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 this evolution, but the movement towards electric drive is slightly exaggerated because of the practice in mills, factories, 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, 1923 is the first year for which total power employed can be compiled without duplication.

During the twenty-two years from 1923 to 1945 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 about 70 per cent of the total power capacity, rose by 391 per cent. The capacity of water wheels increased only 24 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 by 636 per cent, they still constitute only 5.2 per cent of the total capacity. These include both diesel or compression ignition engines and electric ignition engines, the latter

having less than twice the capacity of the former or 256,970 H.P. against 138,738.

Electric motors driven by current generated in the manufacturing industries showed a small improvement in 1945 from the 1944 capacity while in the mining industries a rise of 4 per cent was recorded.

The following table shows the rated capacity in horse power of all power equipment in manufacturing and mining industries in 1923 and 1945. These include equipment in regular use and idle or reserve equipment in operating industries.

	Capacity (Horse Power)		Increase	
	1923	1945	H. P.	P. C.
<u>Manufacturing Industries</u>				
Water Wheels	587,191	709,598	122,407	20.8
Steam Engines	554,191	1,015,294	461,103	83.2
Internal Combustion Engines	46,829	295,123	248,294	530.2
Total	1,188,211	2,020,015	831,804	70.0
Electric Motors on Purchased Power	958,692	4,586,636	3,627,944	378.4
Total Power	2,146,903	6,606,651	4,459,748	207.7
Electric Motors on Power Generated in the Industries	357,136	787,930	430,794	120.6
Total Electric Motors	1,515,828	5,374,566	4,058,738	308.5
<u>Mining Industries</u>				
Water Wheels	27,528	53,042	25,514	92.7
Steam Engines	148,039	125,190	- 22,849	- 15.4
Internal Combustion Engines	6,914	100,588	93,674	1,354.8
Total	182,481	278,820	96,339	52.1
Electric Motors on Purchased Power	118,835	708,775	589,940	496.4
Total Power	301,316	987,595	686,279	226.8
Electric Motors on Power Generated in the Industries	53,860	90,142	36,282	67.4
Total Electric Motors	172,695	798,917	626,222	362.6
<u>Manufacturing and Mining Industries</u>				
Water Wheels	614,719	762,640	147,921	24.1
Steam Engines	702,230	1,140,484	438,254	62.4
Internal Combustion Engines	53,743	395,711	341,968	636.3
Total	1,370,692	2,298,835	928,143	67.7
Electric Motors on Purchased Power	1,077,527	5,295,411	4,217,884	391.4
Total Power	2,448,219	7,594,246	5,146,027	210.2
Electric Motors on Power Generated in the Industries	410,996	878,072	467,076	113.6
Total Electric Motors	1,488,523	6,173,483	4,584,960	314.7

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 approximately the same, around 6 to 8 per cent. The equipment in regular use is more informative than total figures and when data for several years are available these tables will be compiled on the basis of equipment in regular use. In the meantime, comparisons are possible only for total equipment in the operating plants. Although equipment in idle plants might be considered as idle or spare equipment in the industry or group of industries, it is not included in these tables as reports are received only from plants in operation during the year. With increased business the idle equipment might be expected to decline in both total capacity and as a percentage of the total, but this has not occurred. In 1935 idle equipment in the manufacturing industry had a total capacity of 255,347 h.p. or 5.9 per cent of the total capacity, whereas in 1945 the capacity was 530,218 or 8 per cent of the total. Apparently a certain amount of reserve or stand-by equipment is required in various industries.

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 34 per cent in 1945.

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 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.

Table 4 shows the power equipment in regular use in manufacturing plants operating during 1945. 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 1945 was 12,740,960,000 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.

The mining industries are practically as highly electrified as the manufacturing industries, the ratio increasing from 57.3 p.c. in 1923 to 81.1 p.c. in 1945. 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 1925 to 150,855 h.p. in 1945 as compared with a decrease from 57,308 to 24,525 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 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 have 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 employees. The number of employees fluctuate more quickly than installed power equipment capacities. Thus the reduction of employees in 1955 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 day 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.

Table 1

POWER EQUIPMENT OF ALL MANUFACTURING INDUSTRIES IN CANADA

SUMMARY					
Year	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.
1925	2,146,903	958,692	357,136	1,315,828	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
1935	4,147,851	2,671,440	502,706	3,174,147	76.5
1935	4,546,775	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
1945	6,415,851	4,420,105	760,630	5,180,735	80.7
1944	6,468,439	4,457,296	779,717	5,217,013	80.7
1945	6,608,651	4,586,636	787,930	5,374,566	81.4

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

Table 2

POWER EMPLOYED IN THE MINING INDUSTRY^A 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	301,316	118,835	53,860	172,695	57.3
1924	314,173	125,725	71,376	197,101	62.7
1925	323,862	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	482,544	287,130	76,626	363,756	75.4
1933	533,779	322,361	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	89,368	671,878	76.8
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	984,595	708,775	90,142	798,917	81.1

^A 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		1943		1944		1945	
	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	414,953	80	508,073	74	528,605	75
2. Animal Products	80,895	72	179,322	79	189,159	80	197,221	81
3. Textile Products	107,850	83	266,834	92	277,304	91	285,862	91
4. Wood & Paper Products	1,146,571	50	2,766,491	72	2,845,242	73	2,987,435	74
5. Iron and its "	213,705	89	1,209,202	91	1,260,802	91	1,244,225	91
6. Non-ferrous Metal "	99,963	47	701,970	89	856,664	90	636,900	92
7. Non-metallic Mineral Products	131,780	83	314,221	80	316,177	80	318,121	81
8. Chemical & Allied "	62,447	72	525,762	85	377,448	91	371,535	92
9. Miscellaneous	46,516	86	37,096	98	37,570	98	36,747	99
TOTAL	2,146,903	61	6,415,851	81	6,468,439	81	6,606,651	81

Table 4

POWER EQUIPMENT OF MANUFACTURING INDUSTRIES IN CANADA, 1945

(Equipment in Regular Use)

	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 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 (Thousands of Kilowatt Hours)		H	I
GROUP 1. VEGETABLE PRODUCTS x	528,605	344,973	49,393	394,366	74.6					
	493,854	320,465	46,411	366,876	74.3	562,339	25,350	85,290	672,979	
Biscuits, confectionery, etc.	24,705	22,615	737	23,352	94.5	30,949	151	613	31,713	
Bread and bakery products	19,974	18,505	-	18,505	92.6	39,732	176	-	39,908	
Breweries	26,211	21,517	555	22,072	84.2	37,765	927	274	38,966	
Flour and feed mills	119,981	72,370	1,083	73,453	61.2	151,264	-	2,268	153,532	
Fruit and vegetable preparations	31,709	21,332	887	22,219	70.1	18,992	23	-	19,015	
Rubber goods, footwear, etc.	152,122	78,891	19,665	98,556	64.8	143,403	23,906	56,547	223,856	
Sugar refineries	25,640	8,067	14,876	22,943	89.5	9,915	-	10,025	19,940	
GROUP 2. ANIMAL PRODUCTS x	197,221	155,675	4,541	160,216	81.2					
	184,553	147,968	4,539	152,307	82.5	251,641	35,733	5,608	292,982	
Butter and cheese	49,837	38,646	60	38,706	77.7	49,050	425	12	49,487	
Fish curing and packing	24,339	9,690	2,054	11,744	48.3	13,245	1,591	2,653	17,489	
Leather tanneries	18,529	16,262	548	16,810	90.7	20,505	-	315	20,820	
Slaughtering and meat packing	58,909	54,927	82	55,009	93.4	121,118	33,576	176	154,870	
GROUP 3. TEXTILES AND TEXTILE PRODUCTS x	285,862	229,711	29,567	259,278	90.7					
	266,272	217,136	27,847	244,983	92.0	467,632	52,240	96,086	615,958	
Cotton yarn and cloth	109,860	90,297	10,936	101,233	92.1	207,767	19,057	49,610	276,434	
Hosiery and knitted goods	22,414	15,132	4,238	19,370	86.4	26,958	14	5,905	32,877	
Silk and artificial silk	39,037	28,912	8,145	37,057	94.9	109,364	33,119	24,746	167,229	
Woollen cloth goods	19,725	17,711	369	18,080	91.7	27,889	-	1,144	29,033	
GROUP 4. WOOD & PAPER PRODUCTS x	2,987,435	1,690,231	521,400	2,211,631	74.0					
	2,820,022	1,607,440	494,823	2,102,263	74.5	5,494,697	3,865,289	1,852,368	11,212,354	
Furniture	33,359	25,137	3,825	28,962	86.8	19,636	1,364	3,668	24,668	
Planing mills, sash and door	63,135	38,942	2,143	41,085	65.1	27,698	20	3,650	31,368	
Printing and publishing	28,275	27,743	782	28,525	100.0	38,915	609	160	39,684	
Pulp and paper	2,082,462	1,351,412	410,345	1,761,757	84.6	5,225,343	3,862,446	1,766,582	10,854,371	
Saw mills	474,792	56,571	67,340	123,911	26.1	49,278	412	69,141	118,831	

<u>GROUP 5 IRON AND ITS PRODUCTS</u>	x	1,244,225	1,011,774	119,311	1,131,085	90.9				
		1,149,767	963,928	116,850	1,080,778	94.0	1,373,244	1,185,430	186,247	2,744,921
Agricultural implements		28,075	25,413	-	25,413	90.5	43,033	-	-	43,033
Aircraft		37,077	36,366	-	36,366	98.1	98,188	1,208	-	99,396
Automobiles		65,789	20,881	38,035	58,916	89.6	26,255	-	57,411	85,666
Automobile supplies		69,158	68,823	-	68,823	99.5	81,172	23,703	-	104,875
Bridge and structural steel		33,234	30,899	-	30,899	93.0	28,103	-	-	28,103
Castings, iron		53,934	51,754	975	52,729	97.8	67,746	7,228	659	75,633
Iron and steel products		103,698	101,591	94	101,685	98.1	118,982	-	72	119,054
Machinery		78,926	74,206	391	74,597	94.5	66,678	378	1,062	68,118
Primary iron and steel		512,683	231,030	55,095	286,115	91.5	409,313	1,109,026	109,665	1,628,004
Railway rolling stock		123,251	105,708	9,919	115,627	93.8	122,674	34,598	8,624	165,896
Shipbuilding and repairs		105,913	86,749	3,496	90,245	85.2	117,978	-	501	118,479
<u>GROUP 6. NON-FERROUS METAL PRODUCTS</u>	x	636,900	556,437	26,678	583,115	91.6				
		507,067	452,600	23,450	476,050	93.9	1,183,850	5,855,685	68,177	7,107,712
Aluminium products		30,766	30,472	-	30,472	99.0	44,694	50,943	-	95,637
Brass and copper products		62,630	62,130	-	62,130	99.2	57,319	44,097	-	101,416
Electrical apparatus and supplies		92,535	81,219	18,125	99,344	100.0	133,308	4,235	-	137,543
Non-ferrous smelting and refining		304,671	262,339	5,325	267,664	87.9	931,945	5,756,410	68,177	6,756,532
<u>GROUP 7. NON-METALLIC MINERAL PRODUCTS</u>	x	518,121	246,705	9,476	256,181	80.5				
		280,210	220,018	9,075	229,093	81.8	444,173	866,129	11,674	1,321,976
Abrasive products		11,783	11,657	-	11,657	98.9	21,023	690,904	-	711,927
Cement		78,658	76,136	968	77,104	98.0	146,035	-	418	146,453
Clay products - domestic clay		18,969	12,667	234	12,901	68.0	15,281	2,820	274	18,375
Coke and gas products		30,380	19,357	3,945	23,302	76.7	52,088	13,275	-	65,363
Petroleum products		71,052	37,185	279	37,464	52.7	103,864	-	-	103,864
<u>GROUP 8. CHEMICALS AND CHEMICAL PRODUCTS</u>	x	371,535	317,565	24,594	342,159	92.1				
		340,421	295,249	23,478	318,727	93.6	1,398,756	854,734	52,881	2,306,571
Acids, alkalies and salts		159,454	129,524	11,861	141,385	88.7	526,015	784,687	46,085	1,356,787
Fertilizers		30,698	30,508	-	30,508	99.4	646,227	-	-	646,227
<u>GROUP 9. MISCELLANEOUS INDUSTRIES</u>	x	36,747	33,565	2,970	36,535	99.4				
		34,267	32,265	2,513	34,778	100.0	69,701	370	3,930	74,001
Artificial ice		11,692	11,602	604	12,206	100.0	40,446	-	-	40,446
<u>TOTAL ALL INDUSTRIES - 1945</u>	x	6,006,651	4,586,636	787,930	5,374,566	81.4				
		6,076,433	4,257,069	748,786	5,005,855	82.4	11,246,033	12,740,960	2,362,261	26,349,254
<u>1944</u>	x	6,468,439	4,437,296	779,717	5,217,013	80.6				
		6,034,222	4,188,070	741,528	4,929,598	81.7	10,847,334	14,929,905	2,752,125	28,529,364

x - Including equipment idle or reserve. These totals are comparable with data in reports prior to 1936.

Table 5

POWER EMPLOYED IN MANUFACTURING INDUSTRIES, BY PROVINCES, 1945

(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	4,812	1,262	-	1,262	26.2	1,346	3	-	1,349
Nova Scotia	184,494	87,516	64,455	151,971	82.4	201,081	1,000	91,979	294,060
New Brunswick	229,546	127,944	48,893	176,837	77.0	394,783	11,702	194,714	601,199
Quebec	2,164,814	1,635,953	159,417	1,795,370	82.9	(1)4,858,694	8,765,571	753,719	14,377,984
Ontario	2,518,744	1,846,466	318,483	2,164,949	85.9	3,878,291	3,065,455	869,044	7,812,790
Manitoba	169,462	145,902	5,233	151,135	89.2	340,661	271,879	8,389	620,929
Saskatchewan	76,152	45,012	287	45,299	59.5	97,817	141,599	312	239,728
Alberta	137,095	90,835	909	91,744	66.9	231,818	10	1,134	232,962
British Columbia	590,846	276,165	151,109	427,274	72.5	1,241,526	483,740	442,969	2,168,235
Yukon & N.W. Territories	468	14	-	14	3.0	16	-	-	16
Total	6,076,433	4,257,069	748,786	5,005,855	82.4	x 11,246,033	x 12,740,960	2,362,260	26,349,253

(1) Exclusive Kw. hrs. in Butter and Cheese Industry.

x Revised totals for 1944 are 10,847,334,000 kw.hrs. and 14,929,905,000 instead of 20,300,981,000 and 5,476,251,000 kw.hrs. respectively.

Including Idle and Reserve Equipment

Prince Edward Island	5,379	1,374	-	1,374	25.5				
Nova Scotia	200,144	95,236	65,597	160,833	80.4				
New Brunswick	264,174	135,800	53,549	189,349	71.7				
Quebec	2,365,429	1,777,161	170,568	1,947,729	82.3				
Ontario	2,733,526	1,977,890	336,498	2,314,388	84.7				
Manitoba	180,570	155,365	6,128	161,493	89.4				
Saskatchewan	83,453	47,260	287	47,547	57.0				
Alberta	145,641	95,711	914	96,625	66.3				
British Columbia	627,764	300,822	154,389	455,211	72.5				
Yukon & N.W. Territories	571	17	-	17	3.0				
Total	6,606,651	4,586,636	787,930	5,374,566	81.4				

Table 6

POWER EQUIPMENT - IN REGULAR USE AND INCLUDING IDLE AND RESERVE EQUIPMENT, 1945

MANUFACTURING INDUSTRIES

Industry	TOTAL POWER EMPLOYED		ELECTRIC MOTORS OPERATED BY						ELECTRIC POWER		CONSUMPTION OF ELECTRICITY			
	In Regular Use	Incl. Idle & Reserve Equipment	Central Station Power		Power Generated in the Industries		Total		Per Cent of Total		Purchased from Central Electric Stations		Generated by the Industries	Total
			In Regular Use	Incl. Idle & Reserve	In Regular Use	Incl. Idle & Reserve	In Regular Use	Incl. Idle & Reserve	In Regular Use	Incl. Idle & Reserve	In Regular Use	Incl. Idle & Reserve		
A H.P.	B H.P.	C H.P.	D H.P.	E H.P.	F H.P.	G H.P.	H H.P.	I P.C.	J P.C.	K (Thousands of Kilowatt Hours)				N
1. Vegetable Products	493,854	528,605	320,465	344,973	46,411	49,393	366,876	394,366	74.3	74.6	562,339	25,550	85,290	672,979
2. Animal Products	184,553	197,221	147,968	155,675	4,339	4,541	152,307	160,216	82.5	81.2	251,641	35,733	5,008	292,982
3. Textiles and Textile Products	286,272	285,662	217,136	229,711	27,847	29,567	244,983	259,278	92.0	90.7	467,632	52,240	96,086	615,958
4. Wood & Paper	2,820,022	2,987,435	1,607,440	1,690,231	494,823	521,400	2,102,263	2,211,651	74.5	74.0	5,494,697	3,865,283	1,852,368	11,212,354
5. Iron and its	1,149,767	1,244,225	963,928	1,011,774	116,850	119,311	1,080,778	1,131,085	94.0	90.9	1,373,244	1,185,430	186,247	2,744,921
6. Non-ferrous Metal Products	507,067	636,900	452,600	556,437	23,450	26,678	476,050	583,115	93.9	91.6	1,183,850	5,855,685	68,177	7,107,712
7. Non-metallic Mineral Products	280,210	318,121	220,018	246,703	9,075	9,476	229,093	256,181	81.8	80.5	444,173	866,129	11,674	1,321,976
8. Chemicals and Chemical Products	540,421	371,535	295,249	317,565	23,478	24,594	318,727	342,159	93.6	92.1	1,398,756	854,734	52,881	2,306,371
9. Miscellaneous Industries	34,267	36,747	32,265	33,565	2,513	2,970	34,778	36,535	100.0	99.4	69,701	370	3,930	74,001
Total - 1945	6,076,433	6,606,651	4,257,069	4,586,636	748,786	787,930	5,005,855	5,374,566	82.4	81.4	11,246,033	12,740,960	2,362,261	26,349,254
- 1944	6,034,222	6,468,439	4,188,070	4,437,296	741,528	773,717	4,929,598	5,217,013	81.7	80.7	10,847,334	14,929,905	2,752,125	28,529,364
Per cent change	+ 0.7	+ 2.1	+ 1.6	+ 3.7	+ 1.0	+ 1.1	+ 1.5	+ 3.0			+ 3.7	- 14.7	- 14.1	- 7.5

Table 7

MINING INDUSTRIES

Metal Mining	503,020	572,885	421,338	465,184	45,125	55,366	466,463	520,550	92.7	90.9	1,203,377	86,332	135,697	1,425,406
Non-metal Mining	89,536	98,165	69,917	76,159	8,731	9,147	78,648	85,306	87.8	86.9	168,336	-	11,686	180,022
Sand, Gravel & Stone	49,978	56,760	31,260	36,579	1,104	1,104	32,364	37,683	64.7	66.4	26,184	-	448	26,632
Fuels	233,012	259,785	124,515	130,853	23,850	24,525	148,365	155,378	63.7	59.8	182,327	-	53,933	236,260
Total - 1945	875,546	987,595	647,030	708,775	78,810	90,142	725,840	798,917	82.9	80.9	1,580,224	86,332	201,764	1,868,320
- 1944	879,259	975,185	635,203	687,652	76,814	86,558	712,017	774,210	81.0	79.4	2,321,228	-	210,554	2,531,782
Per cent change	- 0.4	+ 1.3	+ 1.8	+ 3.1	+ 2.6	+ 4.1	+ 1.9	+ 3.2			- 31.9		- 4.1	- 26.2

Totals Tables 6 & 7

MANUFACTURING AND MINING INDUSTRIES

1945	6,951,979	7,594,246	4,894,099	5,295,411	827,596	878,072	5,731,695	6,173,483	82.4	81.3	12,826,257	12,827,292	2,564,025	28,217,574
1944	6,913,481	7,443,624	4,823,273	5,124,948	818,342	866,275	5,641,615	5,991,223	81.6	80.5	13,168,562	14,929,905	2,962,679	31,061,146
Per cent change	+ 0.6	+ 2.0	+ 1.5	+ 3.2	+ 2.4	+ 1.4	+ 1.6	+ 3.0			- 2.6	- 14.1	- 13.4	- 9.2

Table 8

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

	1925	1931	1933	1935	1937	1939	1940	1941	1942	1943	1944	1945
Power Employed - H.P.												
1. Vegetable Products	257,178	322,401	326,666	331,361	347,002	364,195	376,319	402,441	405,076	414,953	508,073	528,605
2. Animal " Prods.	80,895	98,892	112,035	122,560	133,647	145,931	151,321	163,917	165,682	179,322	189,159	197,221
3. Textiles & Textile Prods.	107,850	186,952	215,907	240,549	211,729	234,597	246,054	251,916	258,679	266,834	277,304	285,862
4. Wood & Paper Products	1,146,571	2,126,398	2,035,112	2,160,083	2,420,436	2,579,463	2,677,502	2,772,081	2,742,314	2,766,491	2,845,242	2,987,455
5. Iron and its " "	213,705	589,261	626,730	660,491	719,265	730,594	763,195	963,548	1,056,870	1,209,202	1,260,802	1,244,225
6. Non-ferrous Metal " "	99,963	424,738	434,581	416,927	472,031	549,120	598,106	673,480	656,415	701,970	656,664	636,900
7. Non-metallic Mineral Prods.	131,780	212,179	219,612	222,555	239,898	257,731	270,534	285,820	289,332	314,221	316,177	318,121
8. Chemicals & Allied " "	62,447	96,893	110,873	130,464	141,755	158,300	179,741	302,746	354,314	525,762	377,448	371,535
9. Miscellaneous Industries	46,516	56,963	66,315	61,785	26,520	27,361	28,163	34,127	32,107	37,096	37,570	36,747
Total	2,146,903	4,114,677	4,147,831	4,346,775	4,712,283	5,047,292	5,290,935	5,850,076	5,969,895	6,415,851	6,468,439	6,606,651
Employees												
1. Vegetable Products	65,595	77,706	73,095	79,285	94,258	99,447	103,634	113,753	115,476	117,243	130,679	135,311
2. Animal Products	61,517	51,297	55,111	60,124	67,996	69,358	73,666	82,131	87,058	88,057	94,195	98,267
3. Textiles & Textile Prods.	92,669	105,473	106,235	120,699	121,677	121,022	136,973	156,892	165,478	157,987	153,122	158,148
4. Wood & Paper Products	128,404	121,672	105,471	123,724	147,254	144,782	160,868	179,967	186,108	183,865	189,674	199,373
5. Iron and its " "	88,071	96,927	70,947	95,426	127,148	121,041	164,325	253,701	360,845	435,744	411,944	321,719
6. Non-ferrous Metal " "	21,409	34,414	25,273	33,613	44,614	44,563	54,317	73,450	90,937	109,522	104,314	88,350
7. Non-metallic Mineral Products	24,978	24,895	19,296	23,342	23,837	23,026	25,415	28,829	30,707	30,994	31,590	32,525
8. Chemicals & Allied " "	15,149	15,207	15,397	18,933	21,968	22,595	27,682	54,014	93,030	92,288	81,822	60,723
9. Miscellaneous Industries	16,581	12,821	10,361	12,270	11,699	12,280	13,364	18,441	22,474	25,388	25,542	24,956
Total	514,173	540,412	479,186	567,416	660,451	658,114	762,244	961,178	1,152,091	1,241,068	1,222,882	1,119,372
Average Horse power of Equipment in Manufacturing Industries per Employee												
1. Vegetable Products	5.9	4.1	4.5	3.9	3.7	3.7	3.6	3.5	3.5	3.5	3.9	3.9
2. Animal Products	1.3	1.9	2.1	2.0	2.0	2.1	2.1	2.0	1.9	2.0	2.0	2.0
3. Textiles & Textile Prods.	1.2	1.8	2.0	1.9	1.7	1.9	1.8	1.6	1.6	1.7	1.8	1.8
4. Wood & Paper Products	8.9	17.5	19.3	16.8	16.4	17.8	16.7	15.4	14.7	15.1	15.0	15.0
5. Iron and its " "	2.4	6.1	8.8	6.3	5.7	6.0	4.6	3.8	2.9	2.8	3.1	3.9
6. Non-ferrous Metal " "	4.7	12.3	17.2	12.5	10.6	12.3	11.0	9.2	7.2	6.4	5.3	7.2
7. Non-metallic Mineral Products	5.3	8.5	11.4	10.8	10.1	11.2	10.6	9.9	9.4	10.1	10.0	9.8
8. Chemicals & Allied " "	4.1	6.4	7.2	6.9	6.5	7.0	6.5	5.6	3.8	5.7	4.6	6.1
9. Miscellaneous Industries	2.8	4.4	6.4	2.6	2.3	2.2	2.1	1.9	1.4	1.5	1.5	1.5
Total	4.2	7.6	8.7	7.5	7.1	7.7	6.9	6.1	5.2	5.2	5.3	5.9

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