

ENERGY SUPPLY AND CONSUMPTION PATTERNS FOR
THE GERMAN DEMOCRATIC REPUBLIC,
RHONE-ALPES, AND WISCONSIN

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0. Introduction

This paper is intended to give a more detailed overview of energy supply and consumption patterns of the GDR, Rhone-Alpes and Wisconsin for the comparative energy study.

There are two main difficulties in collecting such data: (1) for GDR it is the scarcity of public data before 1972 that would give a complete set of information on the energy supply sector; and (2) the different economic structure of the Rhone-Alpes creates the problem that many data are not available on a regional level, especially in the economic sector.

In the case of Wisconsin, publications of prior studies performed at the Institute of Environmental Studies at the University of Wisconsin have been reproduced -- either in original form or after conversions to facilitate the comparison with the other regions - because these data are closest to the degree of aggregation that is desired for this project.

This data collection is very imperfect in that it does not present a short listing of energy use by fuel type and user group, or of the activities of each economic sector, measured in the same units for all three regions. Another drawback is that only a few long-range trends can be extracted from these data. It is hoped that such a listing -- in more detail than the one given in the first working paper -- can soon be presented.

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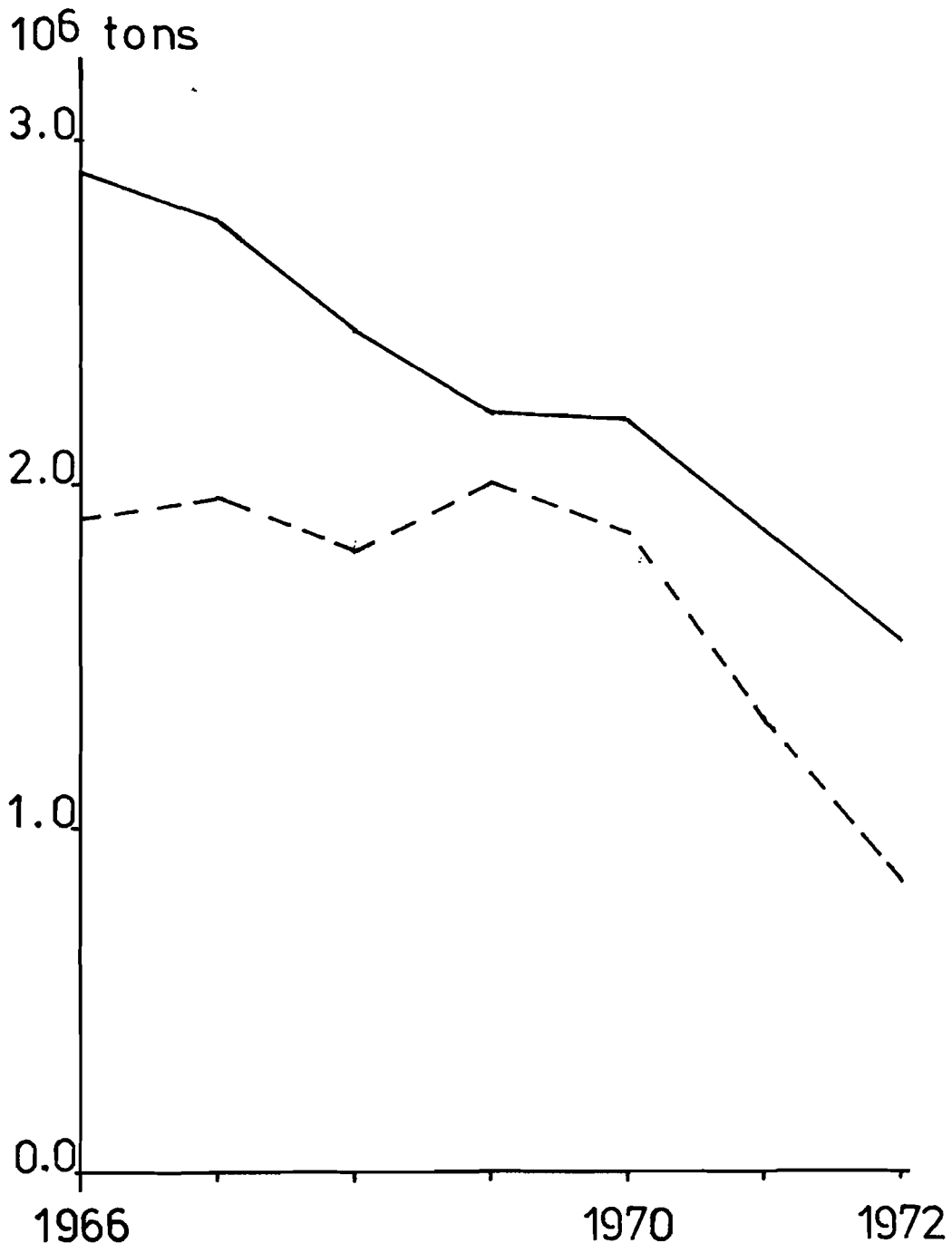
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PRODUCTION AND SALES OF COAL FROM THE "BASSIN DE LA LOIRE"
AND "BASSIN DU DAUPHINE", 1966 - 1973

Unit: 1,000 tons

	1966	1967	1968	1969	1970	1971	1972
<u>Bassin de la Loire</u>							
Net production	2107	2007	1761	1584	1564	1299	1015
<u>Sales:</u>	1306	1346	1268	1426	1300	879	504
EDF	36%	42%	52%	60%	54%	52%	40%
Iron-works	4%	2%	2%	2%	2%	3%	3%
Other Industry	37%	34%	31%	25%	24%	31%	35%
Domestic & small ind.	23%	20%	13%	9%	8%	9%	10%
	100%	98%	98%	96%	88%	95%	88%
<u>Bassin du Dauphine</u>							
Net Production	792	753	683	615	620	559	518
<u>Sales:</u>	592	602	538	579	565	437	352
EDF	--	--	--	--	--	--	--
Iron-works	--	--	--	1%	--	--	--
Other industry	71%	70%	66%	62%	54%	48%	51%
Domestic & small ind.	27%	27%	30%	27%	25%	30%	32%
	98%	97%	96%	90%	79%	78%	--
Total Net Production	2899	2760	2444	2199	2184	1858	1533

Percent of total net production of coal in France: 5%



RHÔNE-ALPES-- COAL CONSUMPTION

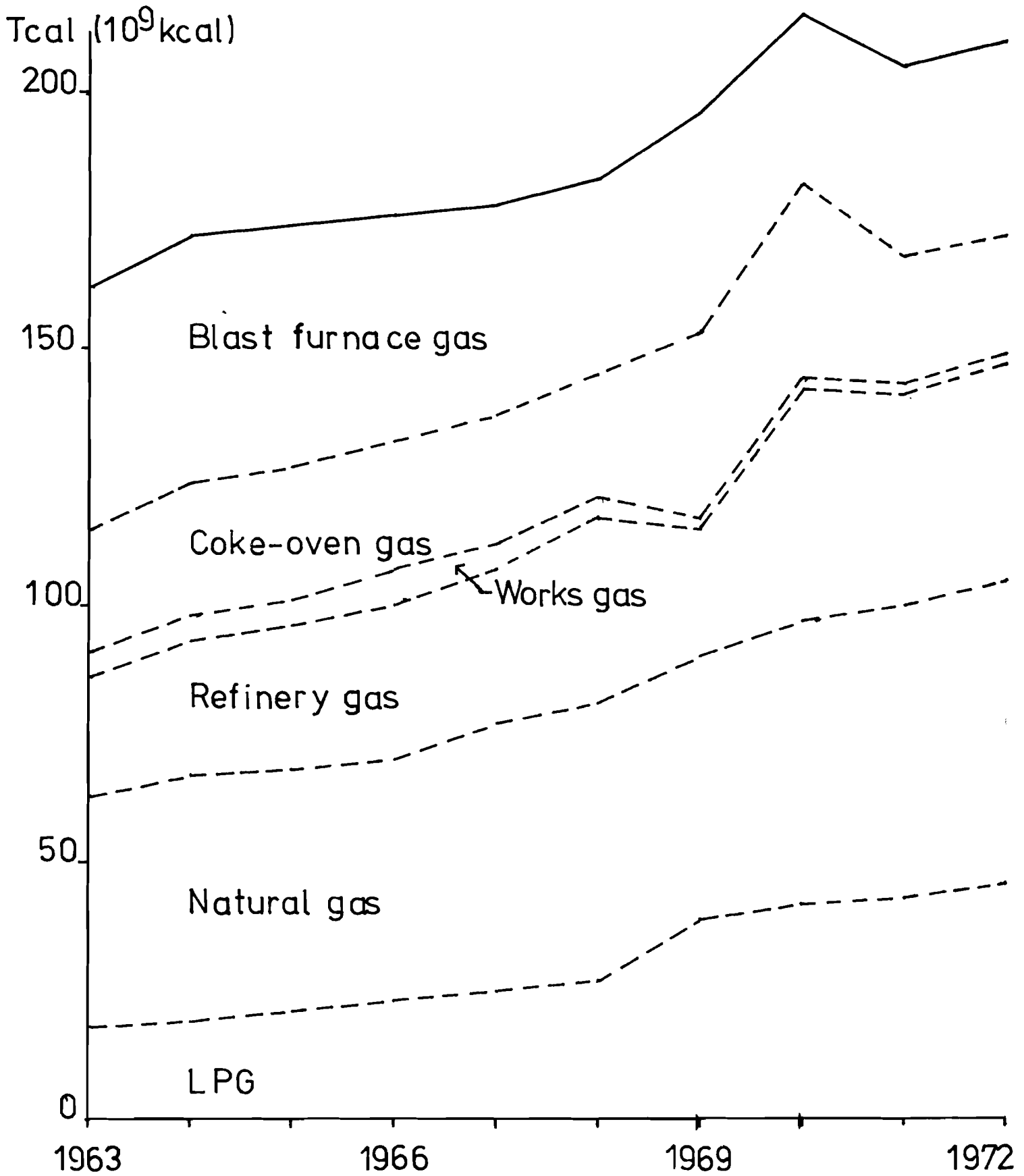
FRANCE - GROSS AND NET GAS PRODUCTION, 1963 - 1972

Unit: 10^9 kcal

	<u>Gross Prod.</u>	<u>Net Prod.</u>
1963	162387	105776
1964	172294	111898
1965	174487	113690
1966	176459	119158
1967	177986	123397
1968	183049	132266
1969	195505	141981
1970	214541	154591
1971	204880	167723
1972	210124	185846

Distribution among types:

	1963	1972	Change (per year)
Natural Gas	28%	33%	+0.54%
Refinery	14%	20%	+0.65%
Liquified Petr. Gas	11%	17%	+0.65%
Works Gas	3%	1%	-0.22%
Coke-Oven	15%	11%	-0.45%
Blast Furnace	28%	18%	-1.16%



FRANCE - GROSS PRODUCTION OF GAS, BY TYPE OF GAS

RHÔNE-ALPES - GAS PRODUCTION, 1971, 1972

	1971		1972	
	Gross production (10 ⁹ kcal)	% of total of France	Gross production (10 ⁹ kcal)	% of total of France
Natural	---	---	---	---
Refineries	3795	---	4026	---
Coke-Oven	553	---	404	---
Blast Furnace	---	---	25501	---
Total*			29931	

* Data on production of works gas and LPG are not available.

RHÔNE-ALPES - SALES OF GAS BY GREAT UTILITIES, 1972

<u>Utility</u>	<u>Sales (10⁹kcal)</u>
"Gas de France"	
- Domestic	2079.9
- Commercial	916.2
- Industrial	598.7
	<u>3594.8</u>
Municipal or private utilities:	
- Domestic	175.0
- Commercial	15.5
- Industrial	5.1
	<u>195.6</u>

RHÔNE-ALPES - INDUSTRIAL GAS CONSUMPTION, 1972

Industry Group	Consumption (10 ⁹ kcal)	% of total industrial consumption
Electric utilities	61	1.2%
Iron works	622	11.3%
Non-ferrous metals	37	0.7%
Electrochemical & electrometallurgical ind.	78	1.4%
Primary transformation of metals	140	2.5%
Construction of mechanical & electrical equipment	581	10.6%
Glass	465	8.5%
Stone, Clay	129	2.3%
Plaster, cement	38	0.7%
Chemicals	2861	52.0%
Food, agricultural products	33	0.6%
Textiles, apparel, leather	411	7.5%
Paper & related prod.	11	0.2%
Other industries	30	0.5%
Total	5497	100.0%

RHÔNE-ALPES- CAPACITY AND PRODUCTION OF THE PETROLEUM REFINERYFEYZIN

Unit: 1000 t

Refinery	1971		1972	
	Capacity	Final product	Capacity	Final product
Feyzin	6960	4690	7225	5478
% of total of France	5.75%	4.67%	4.99%	4.93%

Product Mix in 1972

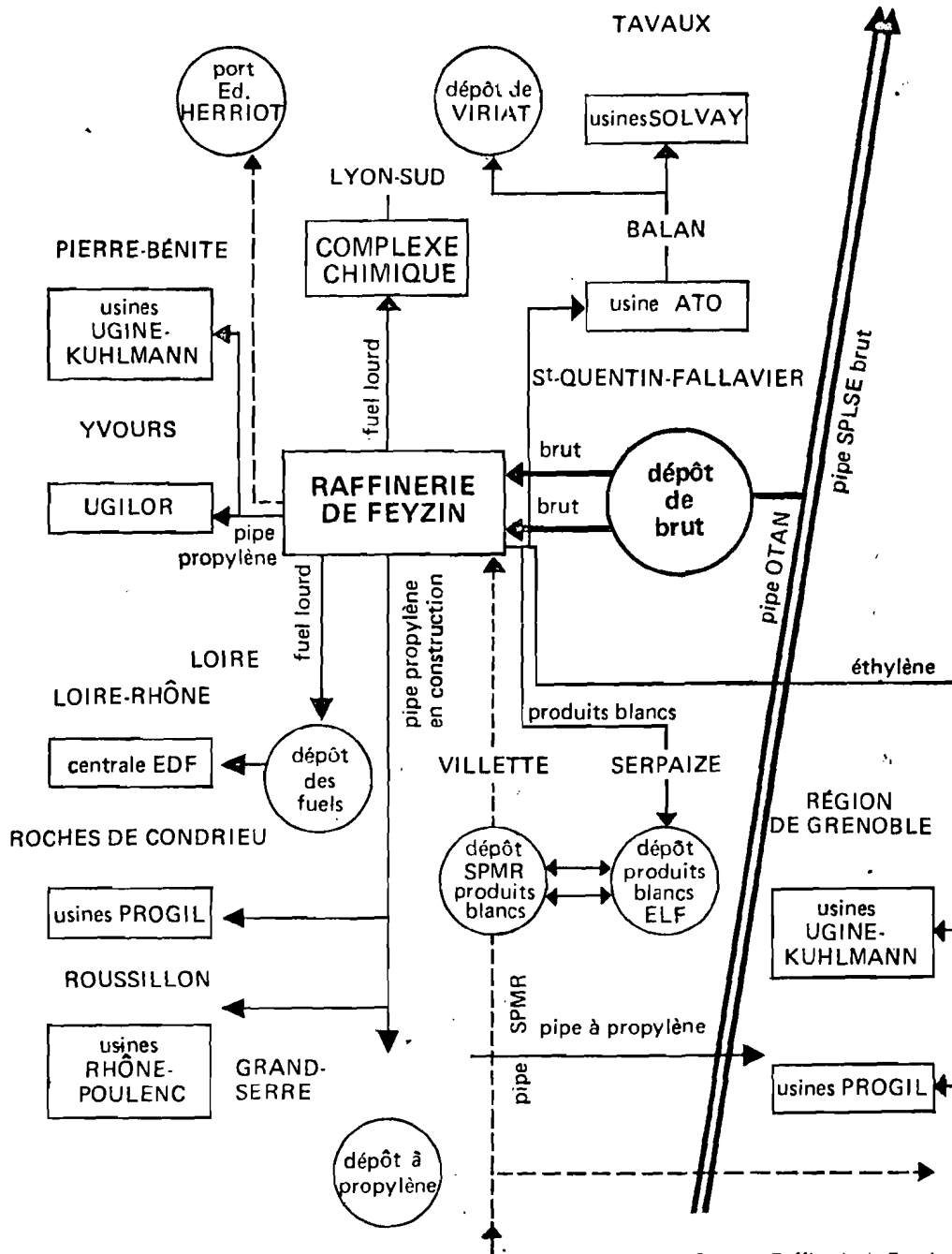
Product	Production (1000t)	% of total production
Gasoline	491.3	9.0
Jet-fuel, kerosene	63.3	1.2
Distillate fuel oil	554.3	10.1
Residual fuel oil	3524.1	64.3
LPG	156.9	2.9
Bitumen	147.6	2.7
Other Products	540.9	9.9
Total	5478.4	100.0

RHÔNE - ALPES - CONSUMPTION OF PETROLEUM PRODUCTS

Product	Quantity Consumed*		
	(1000 m ²)	(1000 Barrels)	(1000 t)
Gasoline, Super-Gasoline	1839.7	(11572.6)	(1359.9)
Diesel-fuel	679.7	(4275.6)	(589.7)
Residual Fuel Oils:			
- domestic(API 22)	(3922.0)	(24671.2)	3606.9
- light (API 20)	(195.1)	(1227.2)	181.8
- heavy (API 18)	(2086.1)	(13122.9)	1970.4
LPG (Butane, Propane)	(332.3)	(2090.3)	180.2

* The figures not in brackets were given in:
 "Annuaire Statistique de la France 1974, Resultats de 1972,
 I.N.S.E.E., Paris"
 The figures in brackets are estimates; gravity and weight factors
 were used according to the "American Petroleum Institute".

INFRASTRUCTURE DU COMPLEXE PÉTROLIER RHÔNE - ALPES A FEYZIN



RHONE - ALPES - HIGH TENSION ELECTRICITY CONSUMPTION BY USERGROUP, 1971

<u>USER GROUP</u>	<u>ENERGY CONSUMED</u> <u>(10⁶ kWh)</u>	<u>% OF TOTAL</u>
Rail Transportation	580.0	3.14
Mines:		
- Coal and Lignite	159.9	0.86
- Iron, minerals & other materials	88.9	0.48
	<u>248.8</u>	<u>1.34</u>
Electrochemical & metallur- gical Ind:		
- Ferro Alloys	1877.6	10.15
- Aluminium	2323.1	12.56
- Other products	1873.8	10.13
	<u>5074.5</u>	<u>32.84</u>
Metallurgy and other indus- tries		
- Iron works	805.9	4.36
- Paper and related pro- ducts	723.5	3.91
- Textiles, leather & apparel	1168.6	6.32
- Other sectors	9888.4	53.48
	<u>12586.4</u>	<u>68.07</u>
Total	18489.7	100.00
	=====	=====

% of France: 18.32%

RHÔNE-ALPES - LOW TENSION ELECTRICITY CONSUMPTION BY USE 1971

<u>USER GROUP</u>	<u>ENERGY CONSUMPTION</u> (10 ⁶ kWh)	<u>% OF TOTAL</u>
Domestic & agricultural	2379.2	64.81
Professional (craftmanship, commerce)	982.1	26.75
Public lighting	201.7	5.49
Public & municipal services	85.6	2.33
Total	<u>3671.2</u>	<u>100.00</u>

% of France: 10.21%

Rhône-Alpes / FranceTrend in Low-Tension Electricity Consumption per person*

Unit: kWh

	1966	1967	1968	1969	1970	1971	1972
Rhône-Alpes	566	582	639	674	746	794	841
France	461	497	544	587	646	702	779

* There are significant differences between the consumption rates in the different départements of Rhône-Alpes (e.g. Ardèche and Haute Savoie: 363 and 716, resp. in 1966; 611 and 1026, resp. in 1972).

The trend however is similar in all départements.

RHÔNE-ALPES/FRANCE

TREND IN ELECTRICITY GENERATION

Year	Thermic Generation (10 ⁶ kWh)	% of total thermic generation in France	Hydropower Generation (10 ⁶ kWh)	% of total hydro-generation in France	Total generation (10 ⁶ kWh)	% of total electric generation in France	Ratio	
							Thermic Rhone-Alpes	Hydro France
1966	1908	3.5	20184	39.0	22092	20.8	8.6	51.3
1967	2434	3.5	18033	39.9	20467	18.3	11.9	59.6
1968	2551	3.8	20117	40.0	22668	19.2	11.3	57.3
1969	3817	4.9	19538	36.9	23355	17.8	16.3	59.8
1970	4187	5.0	22471	39.7	26658	18.9	15.7	59.8
1971	6664	6.6	17628	36.0	24293	16.3	27.4	67.3
1973	8741	7.6	16650	34.2	25391	15.5	34.4	70.3
1973	11353	---	18248	---	29601	---	38.4	---

CHARACTERISTICS AND 1972 PRODUCTION OF THE MAIN HYDROPOWER GENERATING PLANTS IN THE RHÔNE-

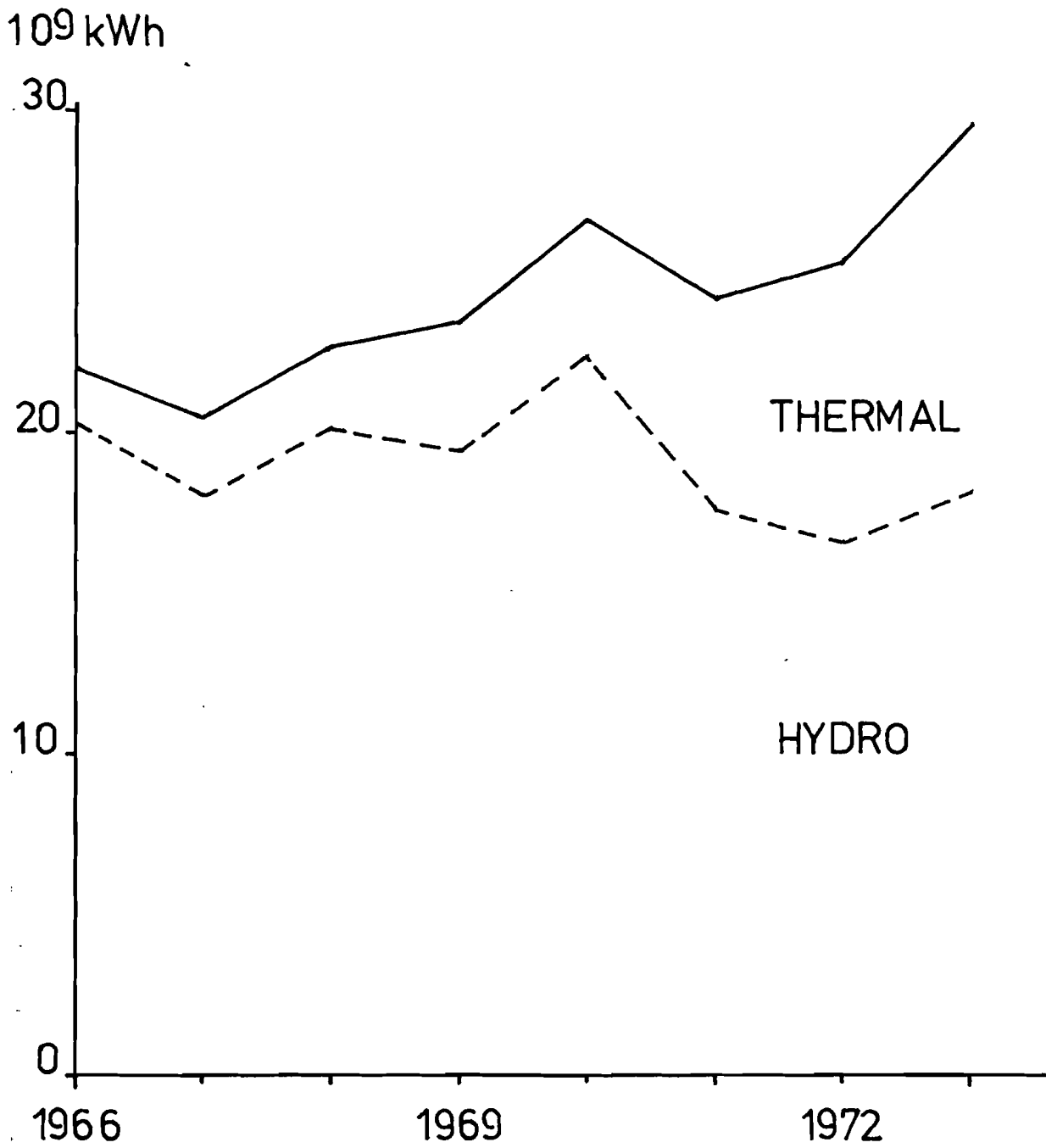
ALPES (WITH MORE THAN 300 x 10⁶ KWH ANNUAL PRODUCTION)

Plant	Département	Owner	Ave. annual production (10 ⁶ kWh)	Maximum performance (1000 KW)	Production in 1972 (10 ⁶ kWh)
Chateauneuf-du-Rhône	Drôme	C.N.R.	1640	285	1297
Génissiat	Ain, Haute-Savoie	"	1660	405	1125
Logis-Neuf	Ardèche - Drôme	"	1190	210	951
Beauchastel	"	"	1210	223	926
Bourg-les-Valence	Drôme	"	1100	190	838
La Bathie-Roselend	Savoie	E.D.F.	1000	522	702
Villarodin	"	"	485	360	516
Gevans	Drôme	C.N.R.	700	116	430
Malgouvert	Savoie	E.D.F.	750	297	426
Pierre-Bénite	Rhône	C.N.R.	530	79	404
Monteynard	Isère	E.D.F.	495	323	382
Cusses	Ain, Rhône, Isère	"	426	62	329
Montpezat	Ardèche	"	300	124	311
Total					8637
Total Hydro-Generation of electricity in Rhône-Alpes, 1972					17628

CHARACTERISTICS AND 1972 PRODUCTION OF THE MAIN THERMIC GENERATING PLANTS IN RHÔNE-ALPES

(WITH MORE THAN 500 x 10⁶ KWH ANNUAL PRODUCTION)

Plant	Departement	Owner	Maximum performance (1000 kW)	Production in 1972 (10 ⁶ kWh)
Loire-sur-Rhône	Rhône	E.D.F.	980	5373
Bugey I	Ain	"	540	1079
Pont-de-Claix	Isère	Electro Ch.	166	933
Lebec	Loire	Mines	170	694
Total				8079
Total Thermic electricity production in Rhone-Alpes, 1972				8741

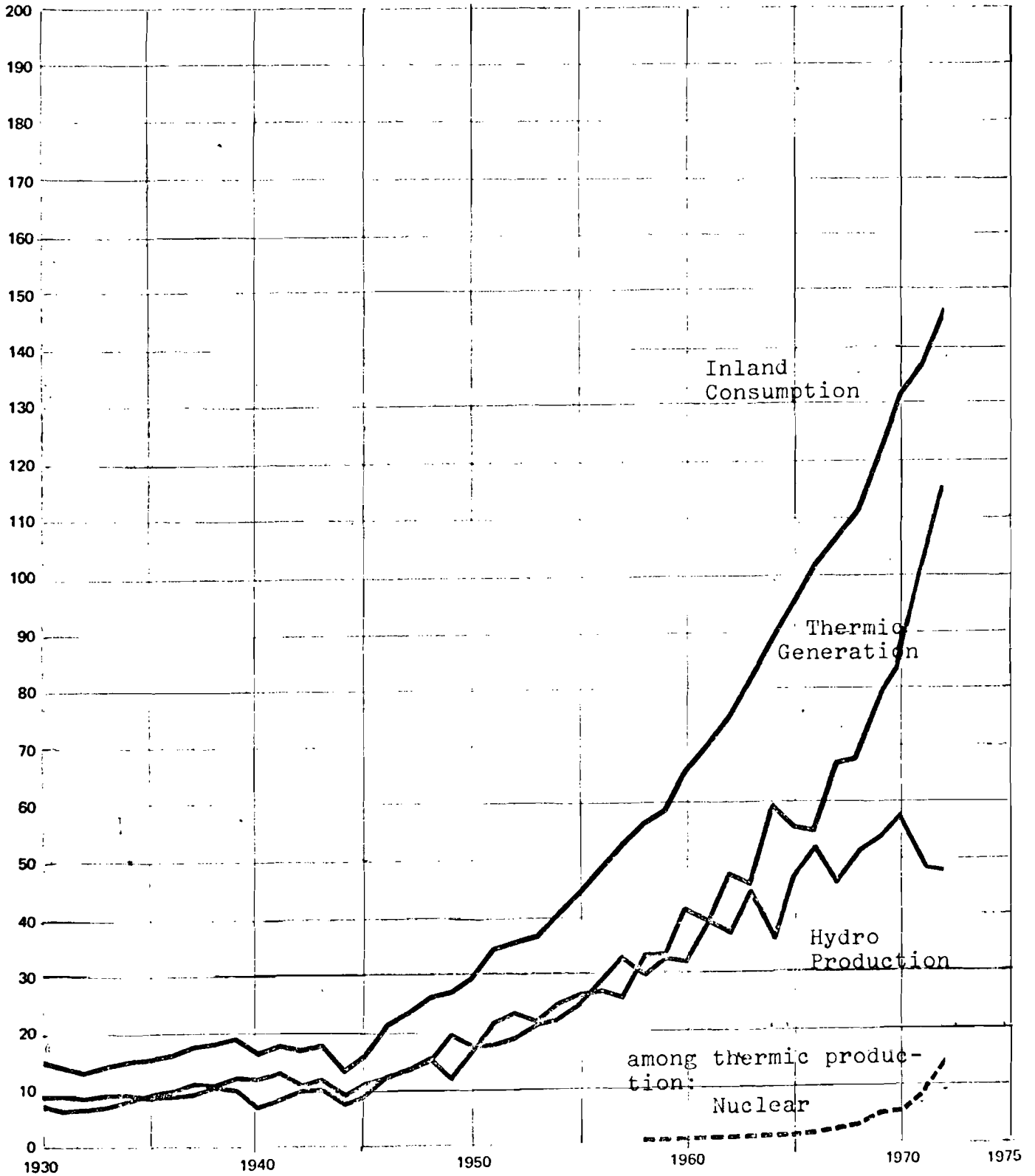


RHÔNE-ALPES - ELECTRIC GENERATION

FRANCE - PRODUCTION AND CONSUMPTION OF ELECTRICITY

Source : Electricité de France

Unit: 10^9 kWh



ENERGY CONSUMPTION IN RHÔNE-ALPES AND FRANCE, BY ENERGY FORM,

1966, 1970, 1972.

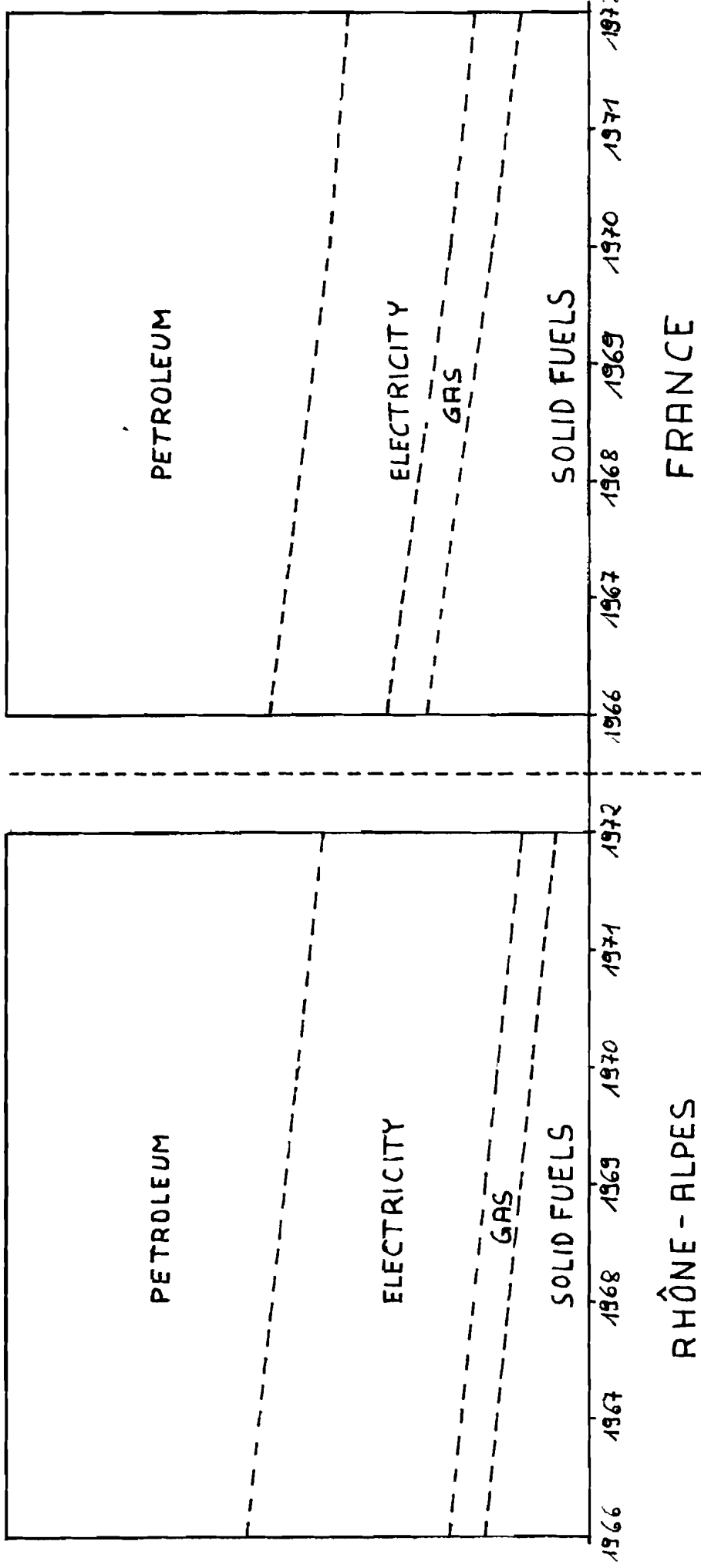
<u>Energy "Forms"</u>	Rhone-Alpes			France		
	1966	1970	1972	1966	1970	1972
Solid fuels	17.8%	9.6%	6.2%	27.9%	17.4%	12.4%
Gas (except blast furnace gas)	6.4%	6.1%	5.9%	6.8%	6.9%	8.0%
Electricity	34.9%	33.9%	33.7%	20.9%	20.6%	21.1%
Petroleum products	40.9%	50.4%	54.2%	44.4%	54.1%	58.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

ENERGY CONSUMPTION IN RHÔNE-ALPES BY ENERGY FORM AND BY USE, 1972.

Unit: 10^9 kcal

User	Energy Form				
	Solid fuels	Gas	Electricity	Fuels	
				domestic	others
Industry					
- Iron works	104.3	* 653.1	1878.1	--	851.2
- Other industries	4535.3	5054.7	36840.3	--	19640.6
	4639.6	5707.8	38718.4	--	20491.8
Domestic & small ind.	4801.3	3346.0	11302.2	37864.4	4042.5
Agriculture	--	--	171.5	--	--
Transportation	28.7	--	1495.9	--	20717.2
Total	9469.6	9053.8	51688.0	37864.4	45251.5
% of total of France	8.1%	7.4%	16.1%	10.8%	8.4%

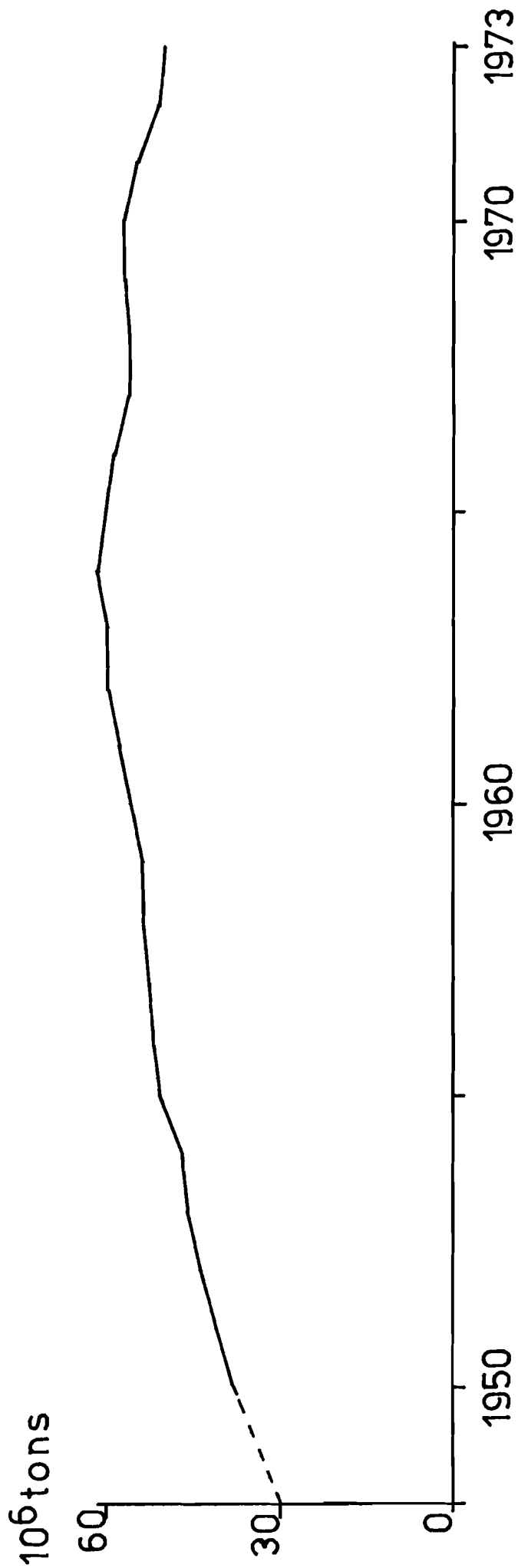
* except works gas



RHÔNE-ALPES / FRANCE - ENERGY CONSUMPTION: DISTRIBUTION AMONG FUEL TYPES

G D R -- Production of Lignite

Year	Production (1000 tons)	Year	Production (1000 tons)
1948	109,960	1961	236,926
1950	137,050	1962	246,992
1951	151,252	1963	254,219
1952	158,462	1964	256,926
1953	172,752	1965	250,839
1954	181,913	1966	249,040
1955	200,612	1967	242,027
1956	205,866	1968	247,113
1957	212,595	1969	254,553
1958	214,970	1970	260,582
1959	214,783	1971	262,814
1960	225,465	1972	248,451
		1973	246,245



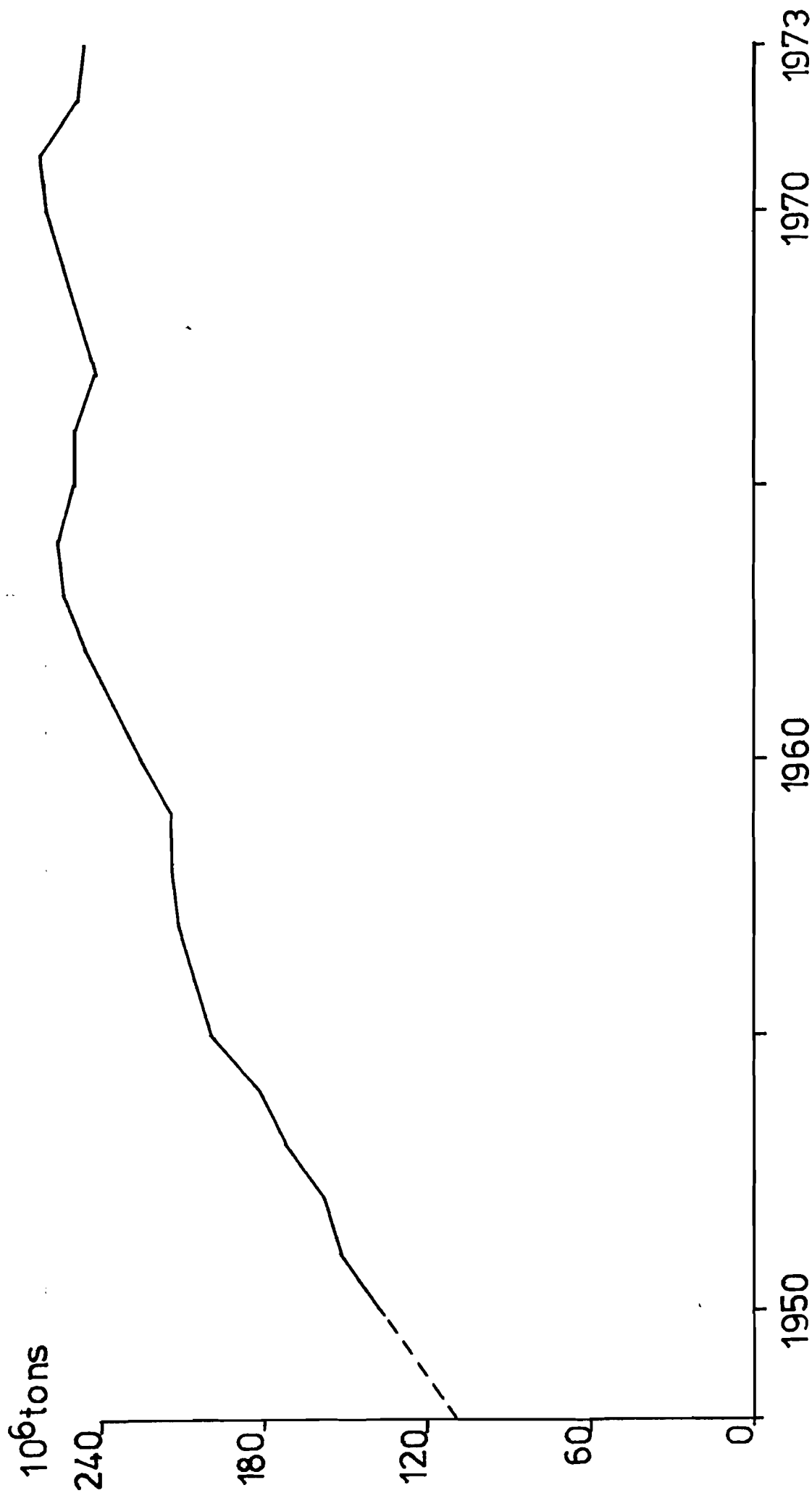
GDR . PRODUCTION OF LIGNITE BRIQUETTES

G D R -- Production of Lignite Briquettes

Year	Production (1000 tons)	Year	Production (1000 tons)
1948	29,822	1961	57,996
1950	37,697	1962	59,727
1951	41,145	1963	60,256
1952	43,599	1964	61,504
1953	45,659	1965	60,380
1954	46,886	1966	59,426
1955	50,967	1967	56,087
1956	51,634	1968	56,389
1957	53,366	1969	56,869
1958	54,008	1970	57,078
1959	54,051	1971	55,439
1960	56,047	1972	50,801
		1973	50,154

G D R -- Export of Lignite Briquettes

Year	Export (1000 t)
1960	6,339
1965	5,962
1969	3,509
1970	3,786
1971	2,760
1972	2,486
1973	2,255



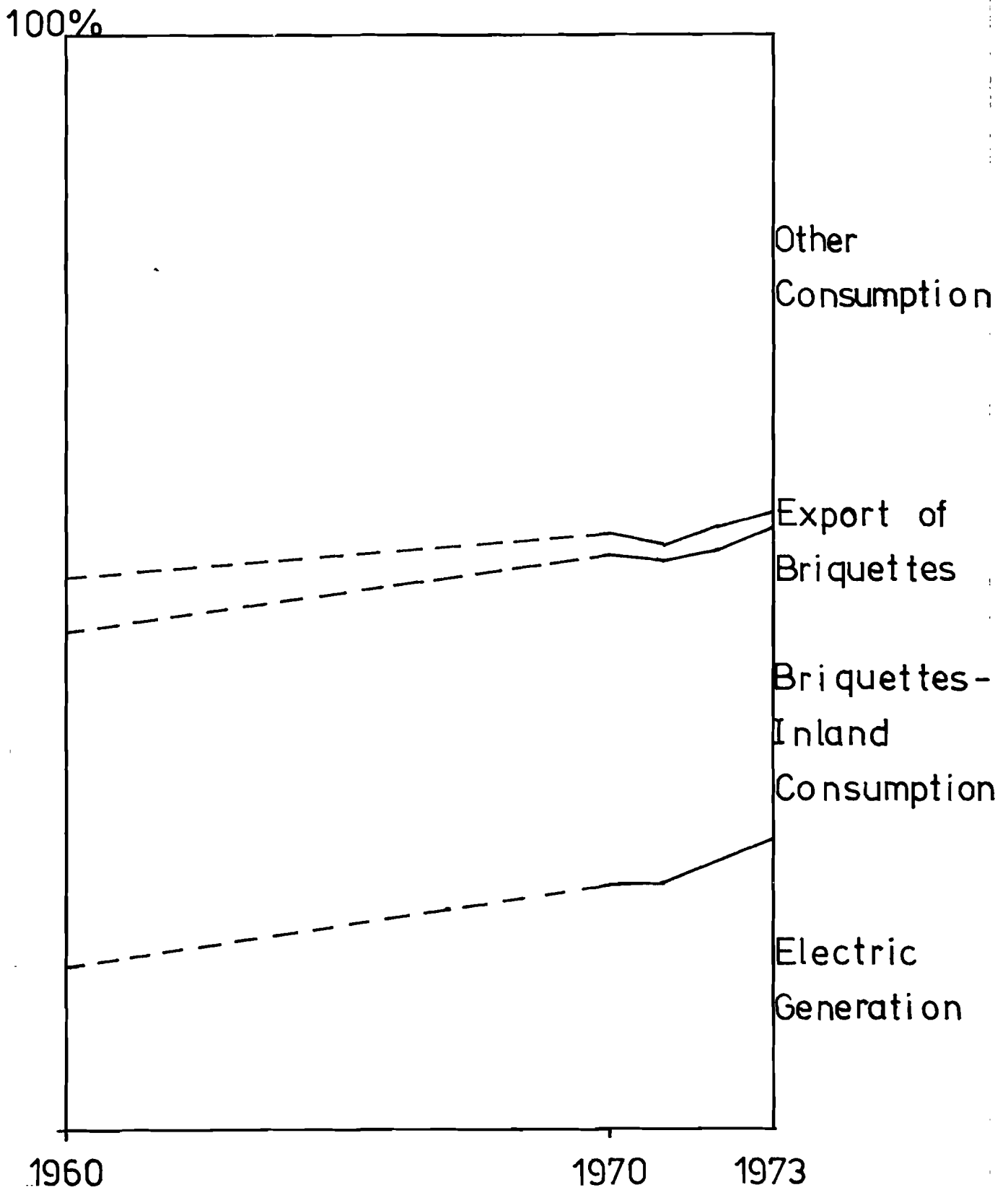
GDR PRODUCTION OF LIGNITE

GDR -- Hard Coal Supply

Year	Production	Import	Unit: 1000 tons Total
1950	2,805	-	-
1955	2,682	-	-
1960	2,721	8,135	10,856
1965	2,212	9,464	11,676
1967	1,789	-	-
1968	1,579	-	-
1969	1,334	6,750	8,084
1970	1,049	8,192	9,241
1971	857	7,973	8,830
1972	815	7,601	8,416
1973	-	8,341	-

GDR -- Hard Coal Coke Supply

Year	Production	Import	Unit: 1000 tons Total
1955	2,705	-	-
1960	3,206	2,527	5,733
1965	3,209	3,205	6,414
1969	-	-	-
1970	2,572	2,777	5,349
1971	-	3,045	-
1972	1,605	3,077	4,682
1973	1,856	3,199	5,055



GDR TREND IN LIGNITE CONSUMPTION

G D R -- City Gas Balance

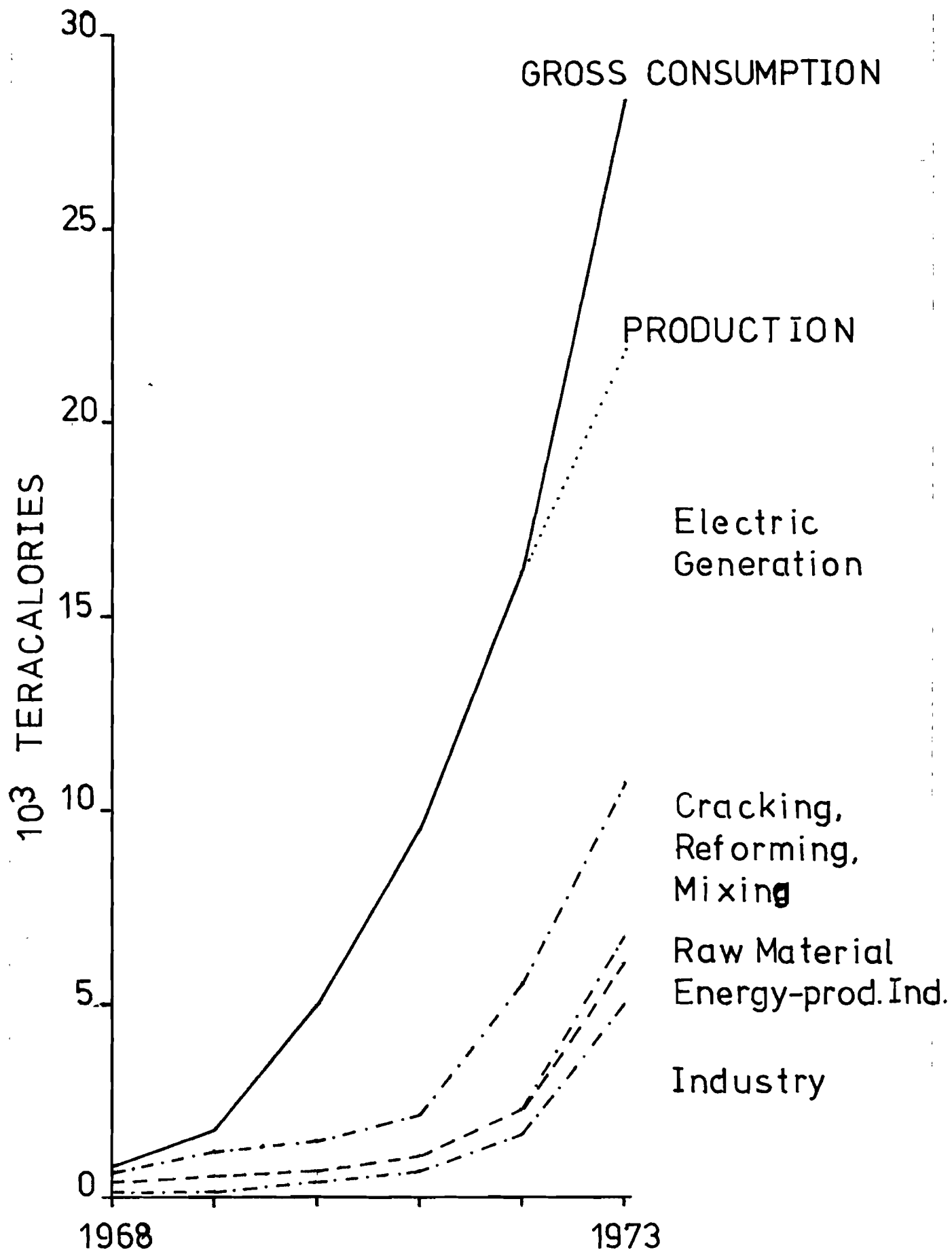
Unit: 10^6 m^3 (a) Supply

<u>Year</u>	<u>Production</u>	<u>Imports</u>	<u>Total Supply</u>
1950	1,498	-	-
1955	2,410	-	-
1960	3,045	-	-
1965	3,406	-	-
1970	4,269	155	4,429
1971	4,480	62	4,542
1972	4,794	4	4,798
1973	4,818	9	4,827

(b) Consumption by User Group 1970 - 1973

User Group	1970	1971	1972	1973	Percent Distribution			
					1970	1971	1972	1973
- Energy Related Industry	41	32	45	56	6.9	0.7	0.9	1.2
- Chemicals	110	121	125	114	2.5	2.7	2.6	2.4
- Metallurgy	375	356	380	286	8.5	7.8	7.9	5.9
- Building Materials	51	64	70	70	1.2	1.4	1.5	1.5
- Water Supply	2	5	5	5	0	0.1	0.1	0.1
- Machinery, Transport, Equipment	483	451	462	470	10.9	9.9	9.6	9.7
- Electrical Equipment, Instruments	71	70	73	85	1.6	1.5	1.5	1.8
- Light Industry	244	312	368	384	5.5	6.9	7.7	7.9
- Food and Kindred Products	98	125	139	140	2.2	2.8	2.9	2.9
- Other Industries	262	258	313	414	5.9	5.7	6.6	8.6
All Industry	1,737	1,794	1,980	2,024	39.2	39.5	41.3	42.0
Non-Industrial Cons.	2,086	2,091	2,176	2,186	47.2	46.0	45.4	45.3
Other Consumption*	75	106	136	95	1.7	2.3	2.8	2.0
Losses	488	524	485	500	11.0	11.5	10.1	10.4
Total Inland Consump.	4,386	4,515	4,777	4,805	99.1	99.4	99.6	99.6
Exports	38	27	21	18	6.9	0.6	0.9	0.4
Total Consumption	4,424	4,542	4,798	4,823	100	100	100	100

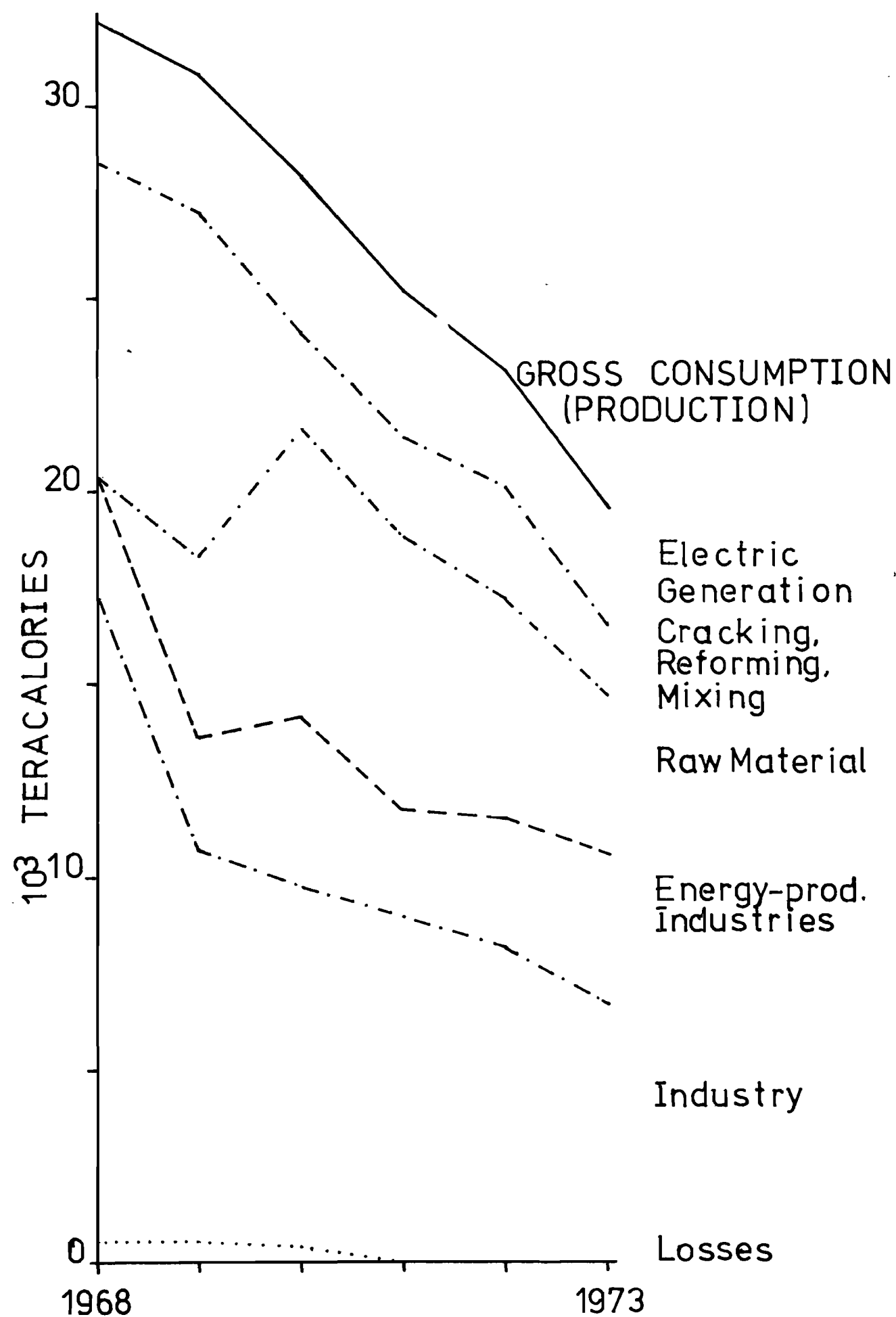
*Includes stock changes.



GDR - NATURAL GAS BALANCE

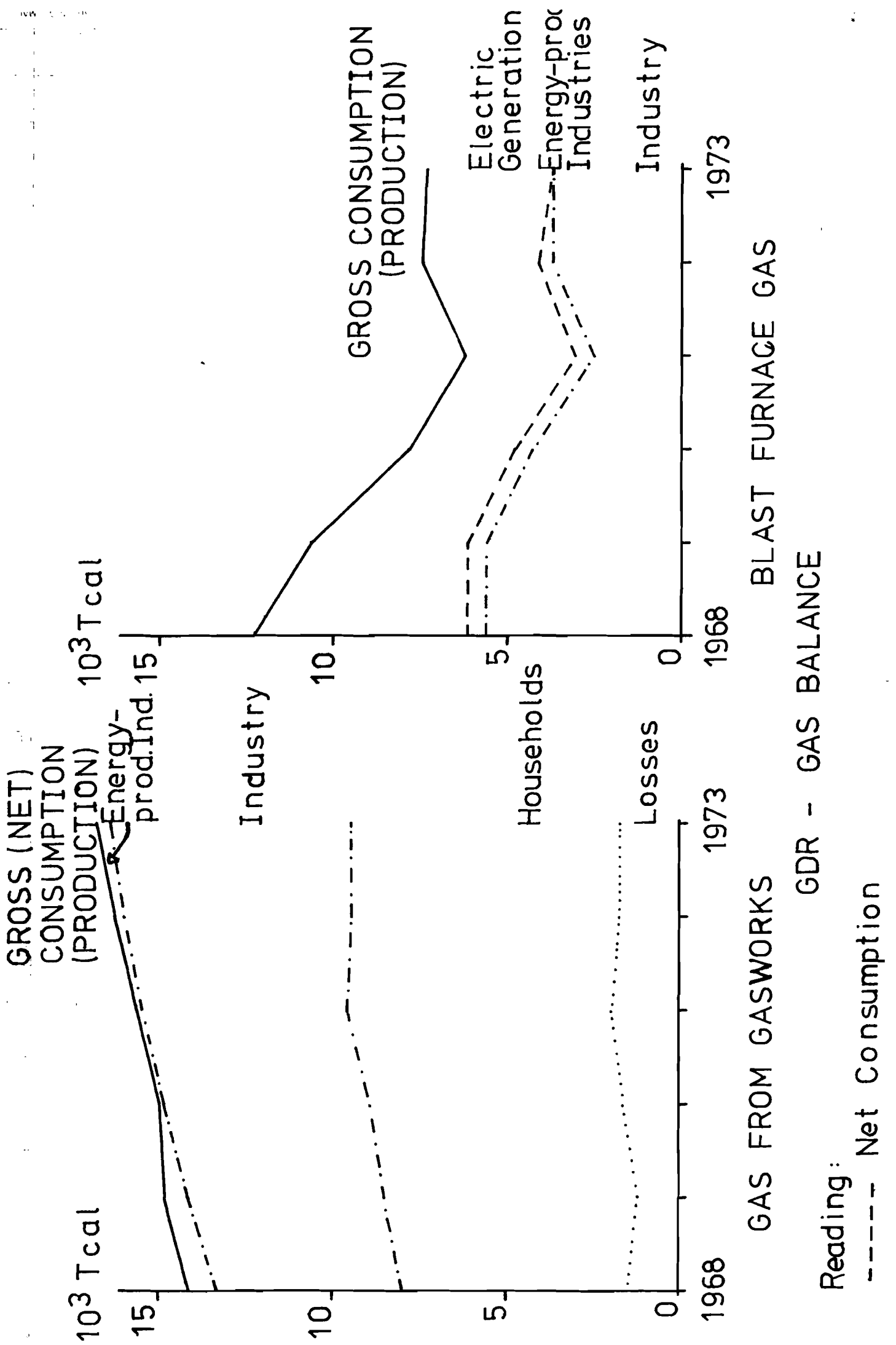
READING:

----- NET CONSUMPTION

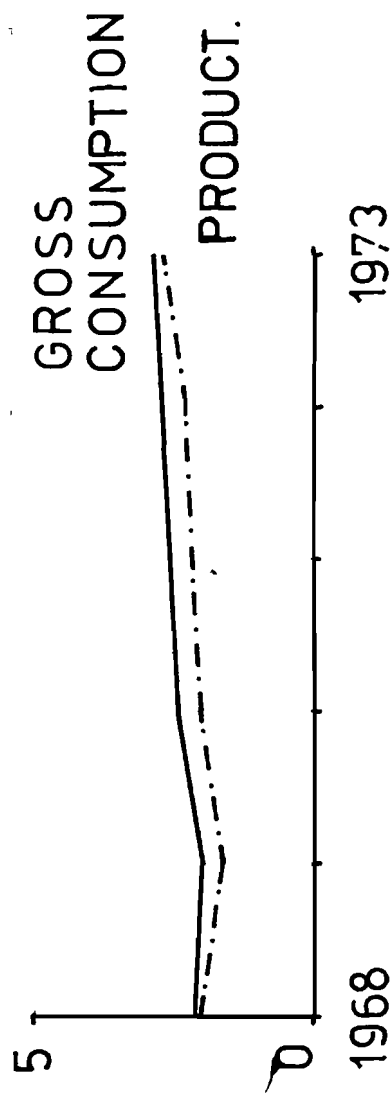


GDR- COKE- OVEN GAS BALANCE

Reading: ---- Net Consumption

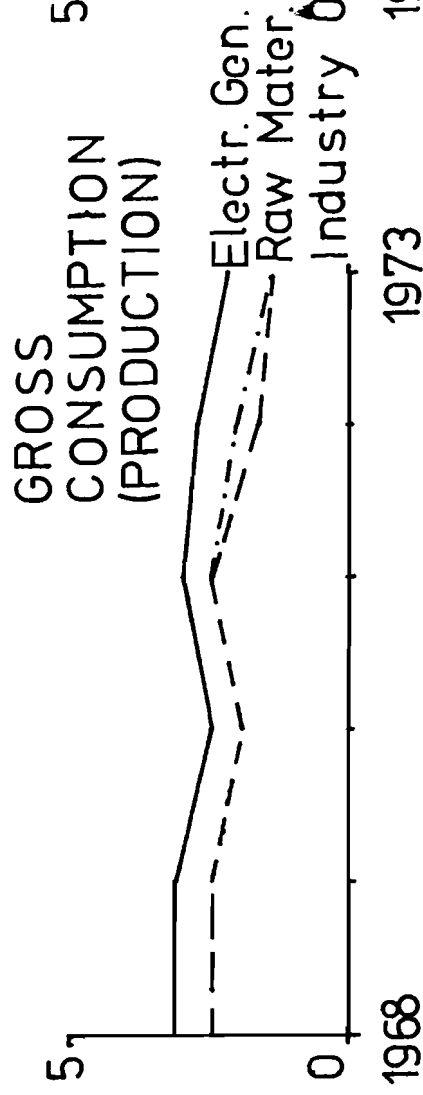


10³ Tcal



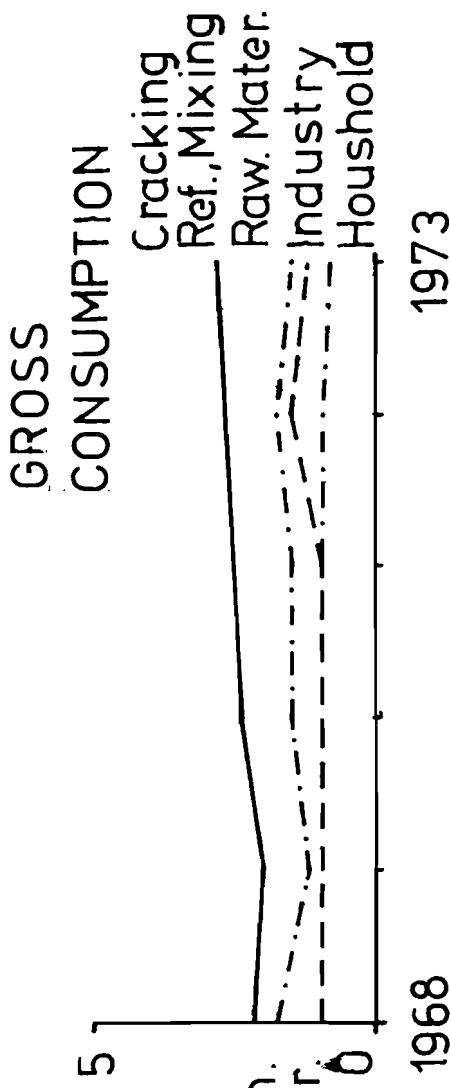
LPG - SUPPLY

10³ Tcal



REFINERY GAS

10³ Tcal



LPG - CONSUMPTION

GDR - GAS BALANCE

READING:

----- Net Consumption

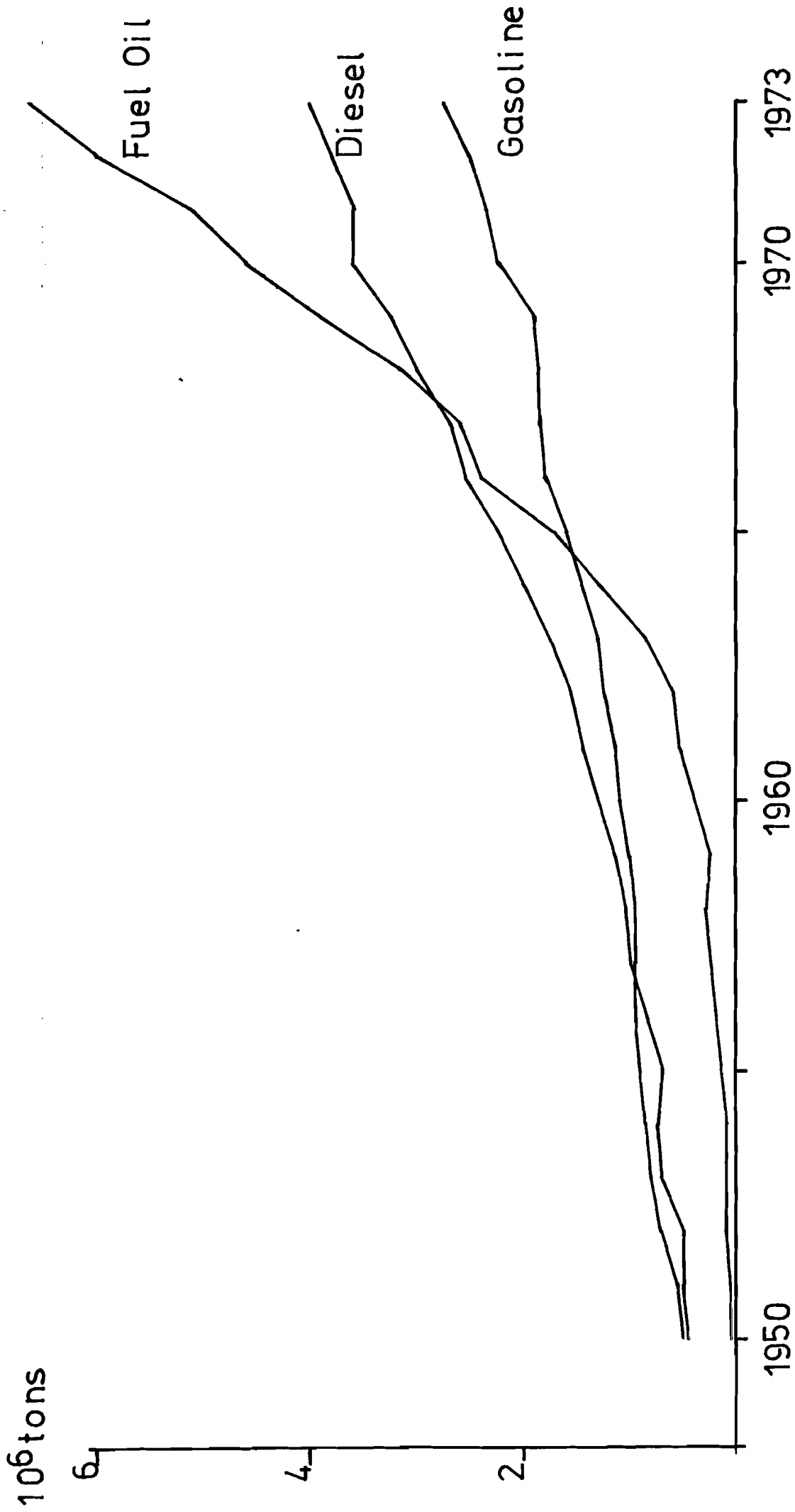
G D R -- Production of Gasoline, Diesel
Fuel and Residual Fuel Oils

Unit: 1000 tons

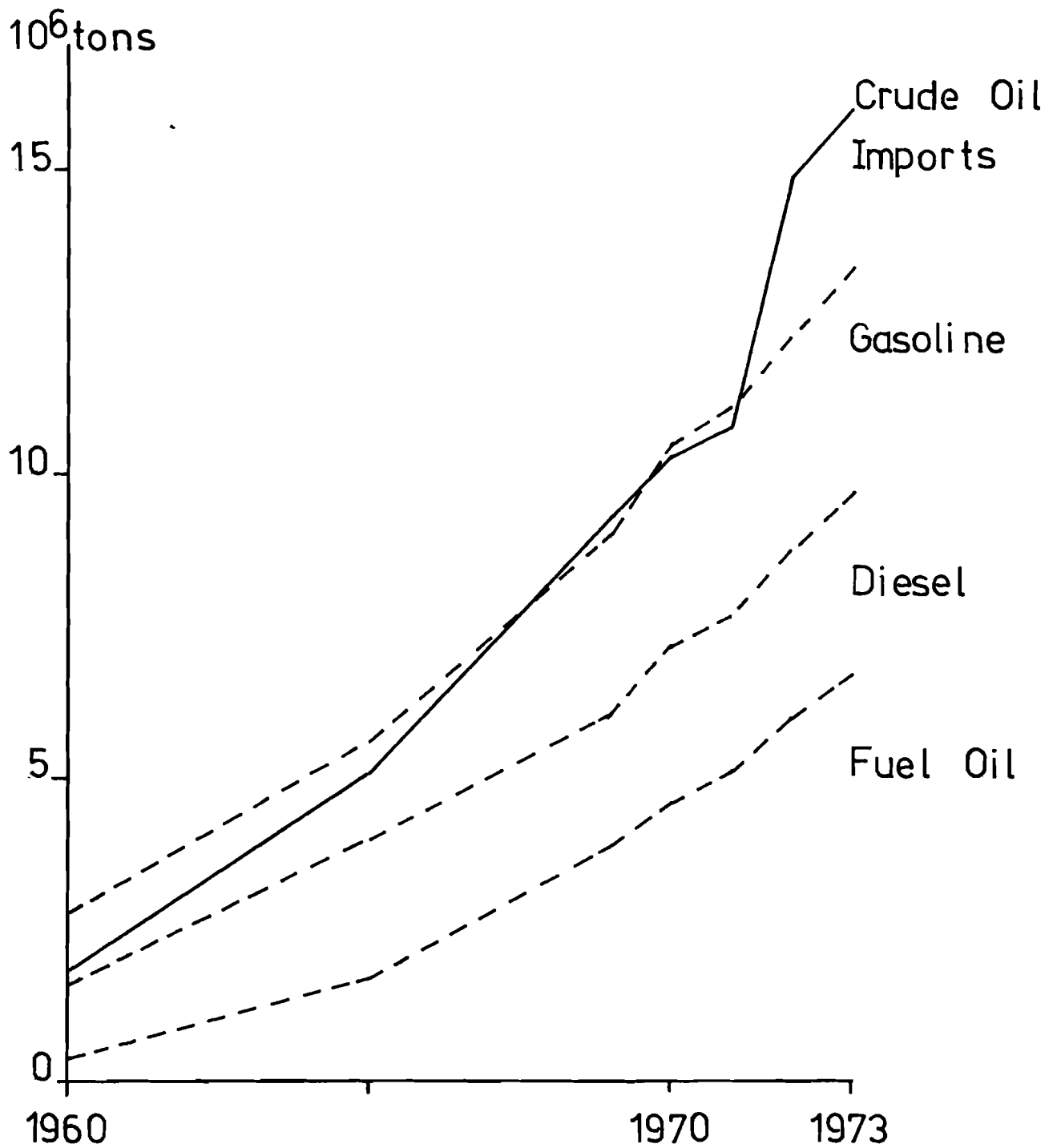
Year	Gasoline	Diesel	Residual Fuel Oil	Year	Gasoline	Diesel	Residual Fuel Oil
1948	-	-	-	1961	1,166.9	1,447.8	526.8
1950	486.0	445.7	63.3	1962	1,268.1	1,581.0	616.6
1951	539.5	482.5	72.2	1963	1,316.2	1,749.3	829.3
1952	697.4	514.6	89.1	1964	1,461.7	2,023.7	1,305.1
1953	798.5	689.6	104.8	1965	1,604.0	2,258.0	1,721.0
1954	849.4	731.6	92.3	1966	1,775.6	2,556.2	2,392.2
1955	895.0	706.7	134.6	1967	1,851.6	2,692.7	2,594.7
1956	939.5	863.8	197.6	1968	1,826.2	2,995.7	3,126.8
1957	942.0	985.5	252.7	1969	1,897.8	3,252.9	3,880.4
1958	961.9	1,068.2	303.0	1970	2,236.2	3,618.8	4,603.9
1959	995.5	1,157.8	247.5	1971	2,358.9	3,619.4	5,096.1
1960	1,079.7	1,289.3	392.5	1972	2,507.2	4,004.1	6,661.5
				1973	2,736.7	4,004.1	6,661.5

G D R -- Imports of Crude Oil

Year	Import (1000 t)
1960	1,941
1965	5,132
1969	9,272
1970	10,334
1971	10,919
1972	14,858
1973	16,045



GDR PRODUCTION OF LIQUID FUELS



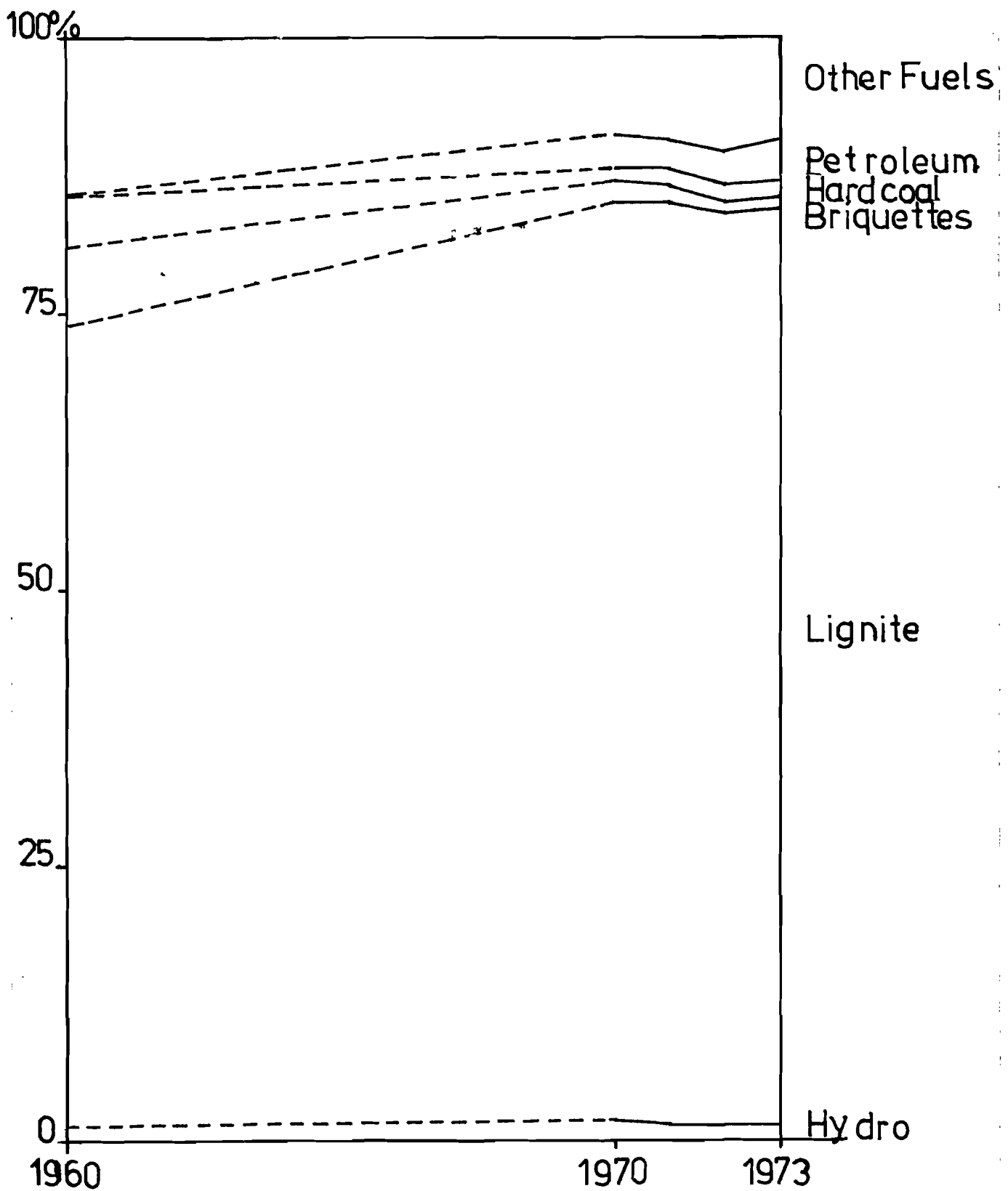
GDR PRODUCTION OF LIQUID FUELS AND
CRUDE OIL IMPORTS

G D R -- Electric Generation by Energy Sources

Energy Source	Production of Electricity (10 ⁶ KWH)				
	1960	1970	1971	1972	1973
Hydropower	617.4	1,250.7	1,251.3	1,223.8	1,259.8
Lignite	29,292.7	56,289.1	57,888.6	59,843.3	63,854.9
Lignite Briquettes	2,738.2	1,216.2	886.8	880.9	722.9
Hard Coal	1,769.7	972.1	1,040.5	892.3	927.9
Petroleum	57.2	1,771.9	1,843.4	2,247.2	2,799.4
Other Fuels	5,829.6	6,150.0	6,509.3	7,740.5	7,343.4
Total	40,304.8	67,650.0	69,420.0	72,828.0	76,908.0

G D R -- Electricity Supply

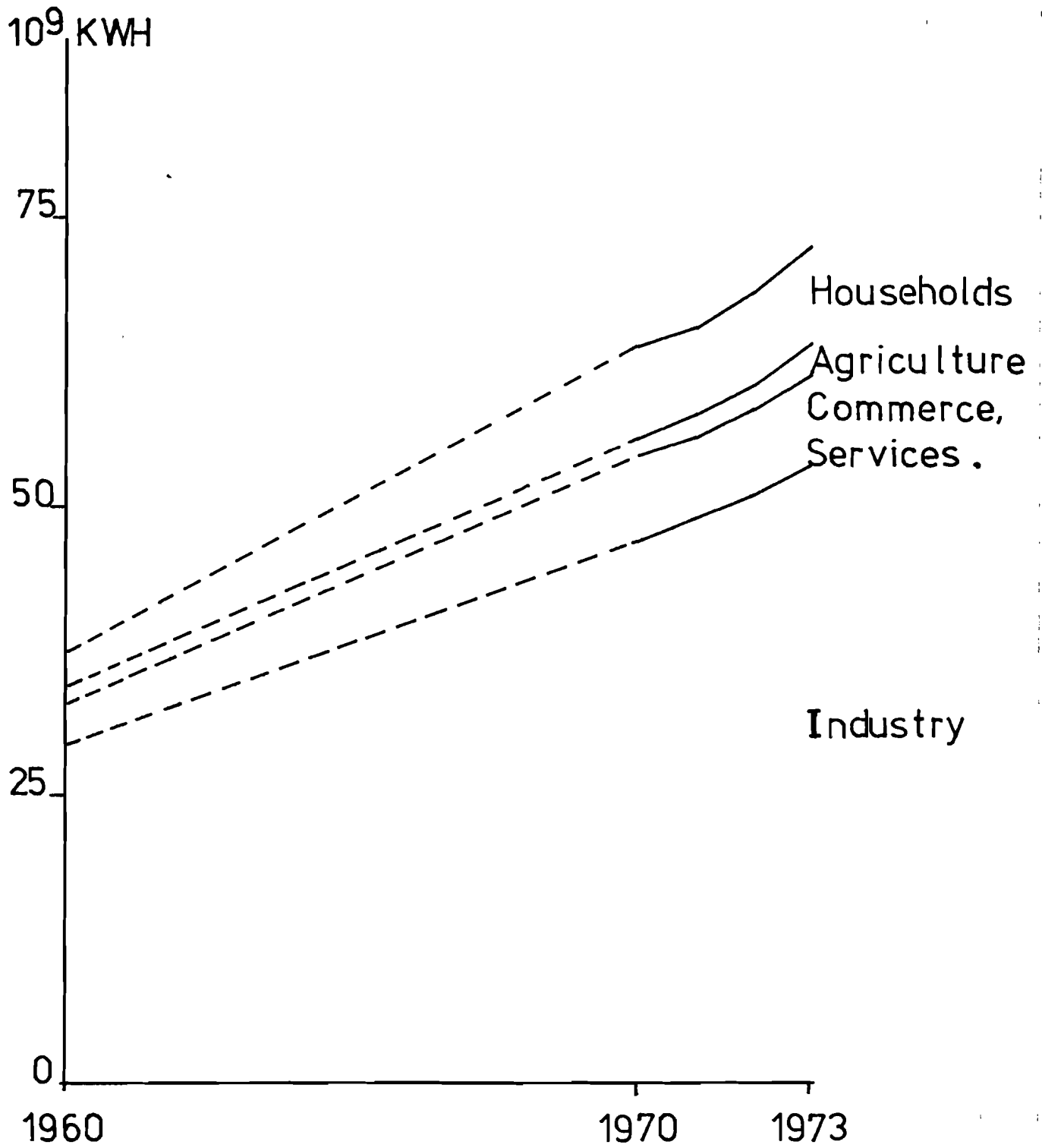
	Electricity Supply (10 ⁶ KWH)				
	1960	1970	1971	1972	1973
Inland Production					
- Public Plants	27,645	51,206	55,887	59,298	64,006
- Industry Plants	12,365	15,962	13,039	13,030	12,517
- Others	295	482	494	500	385
Imports	103	1,230	1,208	1,415	1,665
Total Supply	40,408	68,880	70,628	74,243	78,573



GDR FUEL USE IN ELECTRIC GENERATION

G D R -- Electricity Consumption

	Electricity Consumption (10 ⁶ KWH)					% Distribution of Electricity Cons. 1973
	1960	1970	1971	1972	1973	
Energy-related Ind.	6,171	11,196	12,254	12,850	13,945	17.8
Chemical Industries	13,007	19,590	18,895	19,150	19,564	24.9
Primary Metal Ind.	2,684	4,071	4,476	4,769	4,874	6.2
Machinery and Transport Equipment	1,791	3,489	3,439	3,808	4,194	5.3
Electrical Equipment and Instruments	457	1,093	1,101	1,237	1,390	1.8
Stone, Clay, Glass Concrete	749	1,520	1,709	1,863	2,052	2.6
"Light Industries"	2,355	3,703	3,817	4,041	4,433	5.6
Food and Kindred Products	777	1,358	1,409	1,549	1,667	2.1
Other Industries	1,308	1,191	1,441	1,540	1,561	2.0
Total Industrial Consumption	29,299	97,211	48,541	50,807	53,680	68.3
Water Supply	-	577	682	765	828	1.1
Transportation and Postal Services	772	1,464	1,491	1,520	1,654	2.1
Other Services and Commerce	2,926	5,028	5,156	5,251	5,190	6.6
Total Consumption in the sectors Commerce & Services	3,698	7,069	7,329	7,536	7,672	9.8
Agriculture	1,351	1,870	2,128	2,215	2,777	3.5
Households	2,823	7,118	6,976	7,205	7,527	9.6
Other Users	203	599	621	701	820	1.0
Losses	2,553	4,183	4,285	5,363	5,703	7.3
Total Inland Consumption	39,927	68,050	69,880	73,827	78,179	99.5
Exports	481	830	798	416	394	0.5



GDR ELECTRICITY CONSUMPTION, BY SECTOR

G D R -- Production of Electricity

Year	Production (10 ⁶ KWH)	Year	Production (10 ⁶ KWH)
1948	14,599	1961	42,515
1950	19,466	1962	45,063
1951	21,463	1963	47,450
1952	23,183	1964	51,032
1953	24,247	1965	53,611
1954	26,044	1966	56,866
1955	28,695	1967	59,686
1956	31,182	1968	63,230
1957	32,735	1969	65,463
1958	34,874	1970	67,650
1959	37,248	1971	69,420
1960	40,305	1972	72,828
		1973	76,245

109 KWH

75

50

25

0

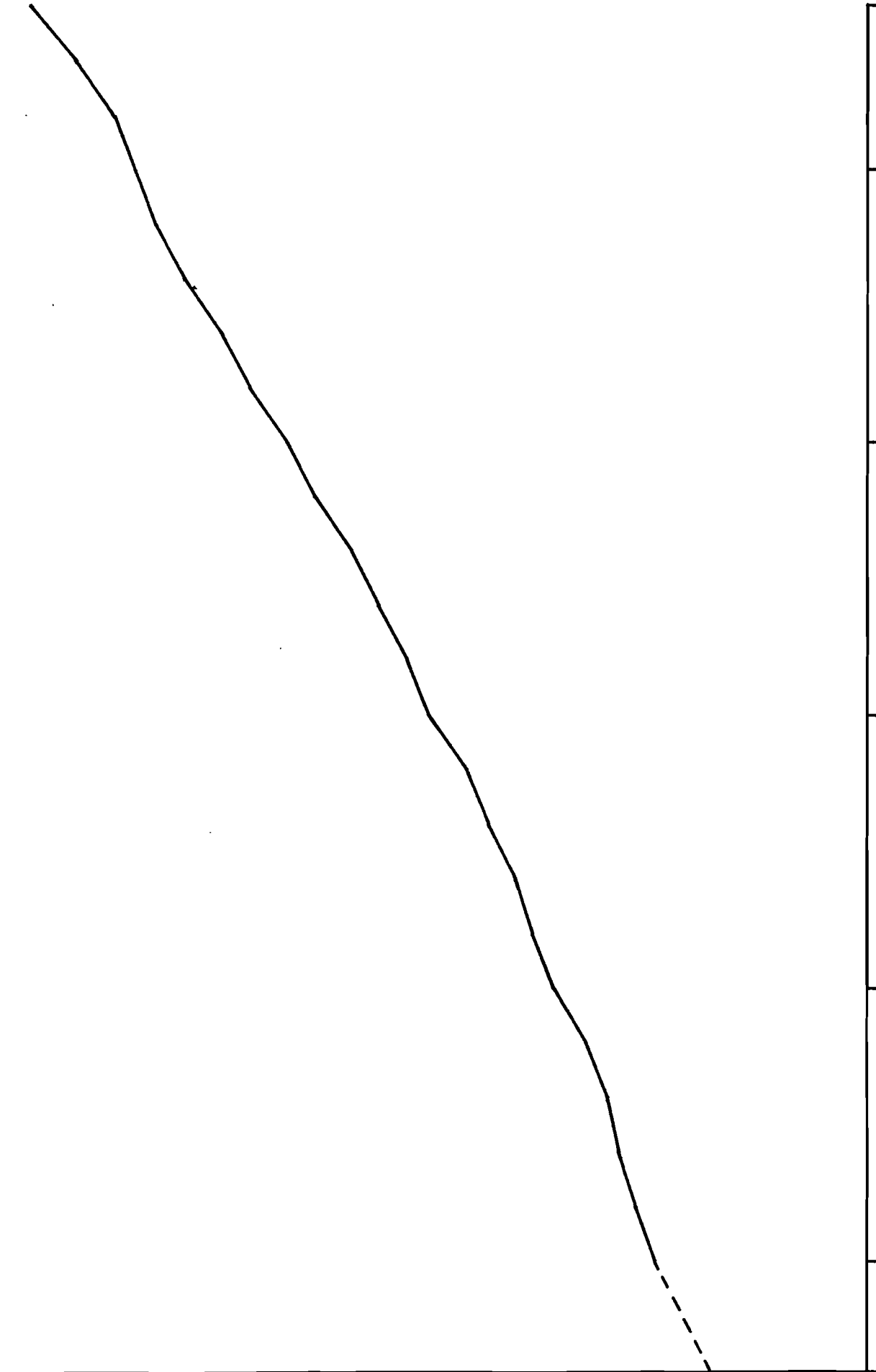
1950

1960

1970

1973

GDR - ELECTRIC GENERATION



COAL SHIPPED TO WISCONSIN, 1970, 1971

Consumer Use	Thousand (metric tons)		10 ¹² cal.*)	Percent of 1971 total	Percent change 1970-71
	1970	1971	1971		
Utility Electric	9964	9477	59.4	68.1	- 4.8
Oven Coke	319	367	2.3	2.6	15.1
Retail Sales	1381	1178	7.4	8.5	-14.7
All others (incl. industry)	4033	2891	18.1	20.8	-28.3
Total	15698	13913	87.3	100.0	-11.4

Source:

U.S. Bureau of Mines, Mineral Industry Surveys "Bituminous Coal and Lignite Distribution, 1971.

*) Assuming 11376 BTU/lb**, from Edison Electric Institute, Statistical Yearbook of Electric Utility Industry, 1971.

** Remark: This corresponds to a heat content of 6270 kcal/kg

ORIGIN OF WISCONSIN COAL

Producing District	Thousands of (metric) tons, 1971	% of total
Eastern Pennsylvania	15	0.11
Western Pennsylvania	96	0.69
Northern West Virginia	659	4.74
Ohio	484	3.48
West Virginia & Virginia	203	1.46
West Virginia, Virginia & Kentucky	2650	19.05
West Kentucky	2673	19.20
Illinois	5444	39.13
Indiana	1556	11.19
Wyoming	125	0.90
Montana & Washington	6	0.05
Total	13913*	100.00

* Does not add up due to rounding errors in conversion.

Source:

U.S. Bureau of Mines, Mineral Industry Surveys, "Bituminous Coal and Lignite Distribution, 1971".

Natural Gas Consumption in Wisconsin, 1971

	Therms (Billions)	% of State Total	% Change 1970-1971
Residential - General	74.2	2.1	- 2.0
- Space Heating	1,059.9	30.5	4.6
Commercial & Industrial - Firm	298.1	8.6	8.8
- Interruptible	1,327.8	38.1	9.0
- Space Heating	514.7	14.8	3.1
Public Authorities - Interruptible	25.2	0.7	-12.2
Interdepartmental	165.8	4.8	8.0
Used by Gas Company	20.3	0.6	6.8
Unaccounted For*	-5.4	-0.2	-76.0
Total	3,480.6	100.0	6.0

Source: Wis. Public Service Commission, Bulletin No. 8

Natural Gas Consumption in Wisconsin, 1971

	Therms (Billions)	% of State Total	% Change 1970-1971
Residential	1,131.6	31.4	4.3
Commercial	455.9	12.7	5.0
Industrial	1,607.7	44.7	10.4
Electric Utilities	301.2	8.4	- 3.5
Other Consumers (includes public agencies)	35.5	1.0	-72.5
Gas Pipeline Pump Fuel	57.3	1.6	-15.7
Distribution Losses	9.9	0.2	-60.4
Total	3,599.1	100.0	2.6

Source: U. S. Bureau of Mines, Mineral Industry Surveys, "Natural Gas Production & Consumption, 1971."

* Negative values can arise because of pressure differences at metering points.

1 Therm = 100,000 BTU = 25,000 kcal

10⁶ Therms = 25 Teracalories

Total Refinery Output 1972, in Wisconsin
Minnesota, North and South Dakota

(Thousands of Barrels)

Motor Gasoline	48,550
Aviation Gasoline	0
Jet Fuel	2,843
Liquified Refinery Gas	1,506
Kerosine	1,339
Distillate Fuel Oil	22,761
Residual Fuel Oil	7,016
Petrochemical Feedstocks	0
Special Naphthas	0
Lube Oil	0
Wax	0
Coke	3,405
Asphalt	6,340
Road Oil	207
Still Gas for Fuel	1,423
<u>Miscellaneous</u>	<u>133</u>
Total	95,543

Source: "Crude Petroleum, Petroleum Products, and Natural-Gas Liquids: 1972", Bureau of Mines

Stocks Held by Refineries and Pipeline CompaniesMinnesota, Wisconsin, North & South Dakota

December 31, 1972

(1000 of Barrels)

Motor Gasoline	7,572
Aviation Gasoline	127
Jet Fuel	947
Liquified Refinery Gas	24
Kerosine	970
Distillate Fuel Oil	6,388
Residual Fuel Oil	1,002
Petrochemical Feedstocks	-
Asphalt	1,106
Coke	620
Others	<u>394</u>
Total	19,150

Source: "Crude Petroleum, Petroleum Products and Natural-Gas-Liquids: 1972", Bureau of Mines

Product as Percent of Barrel of Crude Oil 1968

Product	BOM District which includes Wisconsin	National Average
Gasoline	49.9	44.7
Kerosine	4.1	7.7
Gas, Oil & Distillates	24.8	22.1
Residual Fuel Oil	8.8	7.3
Lubricating Oils	-	1.7
Others*	<u>12.4</u>	<u>16.5</u>
Total	100	100

*Includes petroleum feedstocks, petroleum wax, asphalt, refinery still gas, liquified refinery gas, etc.

ENERGY CONSUMPTION IN WISCONSIN TRANSPORTATION SYSTEMS

Mode	1970		1971		
	Energy (10 ¹² k- cal)	Percent of Total	Energy (10 ¹² k- cal)	Percent of Total	Percent change
Motor Vehicle	62.35	87.3	68.63	87.6	9.0
Urban bus	.21	0.3	0.20	0.3	- 8.0
Rail	2.37	3.4	2.37	3.1	0.05
- Freight	2.27		2.30		1.1
- Passen- ger	0.10		0.07		-26.0
Air	6.45	9.0	7.08	9.0	9.7
Total	71.38*	100.0	78.28*	100.0	9.15

Source:

"1973 Survey of Energy Use in Wisconsin", Institute for Environmental Studies, University of Wisconsin - Madison.

* This is not the sum of all figures in the column.

WISCONSIN NONTRANSPORTATION PETROLEUM ENERGY CONSUMPTION,1971

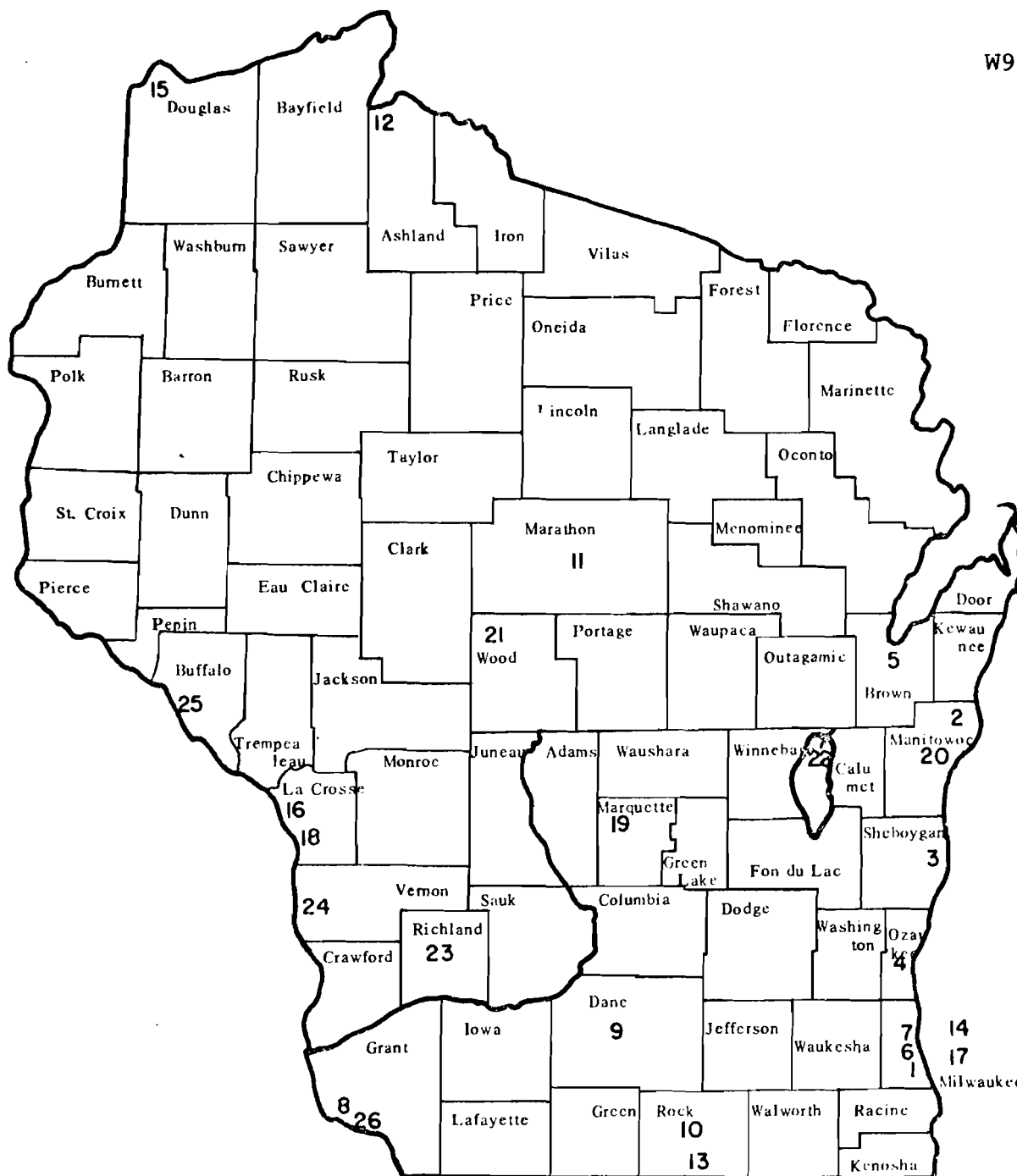
Fuel	Energy Content 1970	(10 ¹² kcal) 1971	Percent change 1970-1971
Kerosine	4.26	3.20	-24.91
Distillate Type Oil	31.53	31.73	0.64
Residential Type Oil	4.70	3.33	-29.16
LPG (liquid petr. gas)	7.71	7.96	3.21
Total	48.19	46.21	- 4.11

Source: U.S. Bureau of Mines, Mineral Industries Surveys.

<u>Wisconsin Generating Plants, 1971</u>				
<u>Type of Generation and Ownership</u>	<u># of Plants</u>	<u>Capacity (KW) Dec. 31, 1971</u>	<u>Generation 1971 (1000 KWH)</u>	<u>Percent of Total Generation</u>
Fossil				
Steam: Private	19	4,487,914	18,922,779	67.12
Municipal	4	153,930	475,187	1.69
Cooperative	4	596,900	3,103,835	11.02
Total	27	5,238,744	22,506,801	79.83
Nuclear				
Steam: Private	1	523,800	3,273,658	11.61
Municipal	0	0	0	
Cooperative	1	50,000	130,000	0.46
Total	2	573,800	3,403,658	12.07
Hydro:				
Private	58	299,621	1,470,491	5.22
Municipal	19	19,589	112,193	0.40
Cooperative	3	17,220	78,730	0.28
Non-Utility	2	35,000	227,661	0.80
Total	82	371,430	1,889,075	6.70
Diesel:				
Private	17	34,131	5,268	0.02
Municipal	20	47,224	43,253	0.15
Cooperative	2	13,900	20,749	0.08
Total	39	95,255	69,275	0.25
Gas				
Turbine: Private	12	324,905	244,570	0.87
Municipal	1	20,000	79,511	0.28
Cooperative	0	0	0	
Total	13	344,905	324,081	1.15
GRAND TOTAL	161	6,624,134	28,192,895	100.00

Sources: Wisconsin Public Service Commission, Bulletin No. 46, "Generating Plants Operated by Wisconsin Electric Utilities."

Rural Electrification Administration, "Annual Statistical Report."



NAME of PLANT	RATED CAPACITY (MW) DEC. 31 1971	NAME of PLANT	RATED CAPACITY (MW) DEC. 31 1971
1. Oak Creek	1,691.6	14. Commerce Street	35.0
2. Point Beach #1	523.8	15. Winslow	26.0
3. Edgewater 1,2,3,4	477.0	16. French Island	25.0
4. Port Washington	400.0	17. East Wells Street	13.7
5. Pulliam	392.5	18. Edison	6.5
6. Lakeside	310.1	19. Westfield	0.1
7. Valley	272.0	20. Manitowoc	69.0
8. Nelson Dewey	227.2	21. Marshfield	41.5
9. Blount Street	194.0	22. Menasha	29.2
10. Rock River	150.0	23. Richland Center	14.3
11. Weston	135.0	24. Genoa 1,2,3	389.7
12. Bay Front	82.2	25. Alma	205.2
13. Blackhawk	50.0	26. Stoneman	52.0
		TOTAL	5,812.6

Figure 8. WISCONSIN STEAM GENERATING PLANTS, 1971

TOTAL ENERGY USED IN WISCONSIN ELECTRICAL GENERATION

Energy Source	Energy Consumed per generation (10 ¹² kcal)	Percent of Total	Energy Consumed per generation (10 ¹² kcal)	Percent of Total	Change 1970-71
Coal	59.8	81.0	56.6	71.2	- 5.3
Natural gas	7.8	10.6	7.4	9.3	- 5.1
Petroleum	1.9	2.6	1.2	1.5	-38.5
Hydro	4.2	5.7	5.1	6.4	20.7
Nuclear	0.1	0.1	9.2	11.6	9075.0
Total	73.6*	100.0	79.5	100.0	7.6

Source:

Wisconsin Public Service Commission, Bulletin No. 8 and
REA, Annual Statistical Report.

* Does not add up due to rounding errors.

Electric Utilities in Wisconsin, 1971

	Number of Utilities	Number of Customers	% of Total Customers	KWH Sold to Ultimate Consumers (1000's)	Percent of Total Sales
Privately Owned	18	1,361,167	83.7	22,616,699	86.5
Municipal	86	148,844	9.1	2,292,453	8.8
Cooperatives*	<u>30</u>	<u>116,990</u>	<u>7.2</u>	<u>1,221,983</u>	<u>4.7</u>
Totals	134	1,627,001	100.0	26,131,135	100.0

* Includes Dairyland Power Cooperative which is only a generating cooperative

Sources: Wisconsin Public Service Commission, Bulletin No. 8, "Statistics of Wisconsin Public Utilities." Rural Electrification Administration, "Annual Statistical Report."

1971 Wisconsin Export - Import of Electricity

KWH sold (thousands)

- to out-of-state Utilities	101,405
- outside Wisconsin by Wisconsin Utilities	668,303
- Dairyland Coop out-of-state sales	1,449,305
Total sold out-of-state	2,218,813

KWH purchased from out-of-state (thousands)

- by Wisconsin Electric Utilities	1,310,794
- by Cooperatives	17,700
Total purchased from out-of-state	1,328,494

Net Flow (thousand KWH) 890,319 out

Source: Wisconsin Public Service Commission, Bulletin No. 8 and REA, Annual Statistical Report

Wisconsin Electricity Consumption, 1971

Class of Service	Electrical Energy 10 ⁶ kWh	Percent of State Total	Percent Growth 1970-1971
Residential	10,135	39.0	5.7
Small Commercial & Industrial	5,237	20.2	5.8
Large Commercial & Industrial	9,785	37.7	4.4
Street & Highway Lighting	418	1.6	5.8
Other Public Authorities	347	1.3	10.9
Interdepartmental	62	0.2	5.1
Total	25,984	100.0	5.3

Source: Edison Electric Institute, "Statistical Yearbook of the Electric Utility Industry for 1971."

Electricity Sold to Ultimate CustomersBy the Six Largest Utilities, 1970 and 1971

Utility	Electricity Sold		Percent of State Total	Percent Growth 1970-1971
	1970	1971	1971	
Wis. Electric Power Co.	9,807	10,266	39.4	4.6
Wis. Public Service Corp.	3,362	3,549	13.6	5.6
Wis. Power & Light Co.	3,244	3,449	13.3	6.3
Northern States Power Co.	1,889	1,954	7.5	3.4
Wis. Mich. Power Co.	1,302	1,349	5.2	3.6
Madison Gas & Electric Co.	1,172	1,254	4.8	7.0
Total	20,776	21,815	83.8	5.0

Source: Wisconsin Public Service Commission, Bulletin No. 5-4, "Operating Revenue and Expense Statistics From All Private Electric Utilities in Wisconsin."

Economic Activity and Electricity Usage of Wisconsin Industry

SIC	Industry	1962 Value Added (millions) (1958 \$)	1962 Electric Use (million KWH)	Electricity Intensiveness (KWH/\$)
26	Pulp, Paper and Products	442.1	1377	3.11
35	Machinery (except elect)	738.7	583	0.79
20	Food and Kindred Prod.	678.2	542	0.80
33	Primary Metals	223.7	522	2.33
37	Transportation Equipment	466.8	355	0.76
34	Fabricated Metals	307.6	285	0.93
36	Electrical Machinery	410.0	273	0.67
32	Stone, Clay and Glass Products	(80.0)	(216)	2.70
30	Rubber Products (n.e.c.)	77.2	147	1.90
27	Printing and Publishing	179.3	105	0.59
24	Lumber and Wood Prod.	97.7	79	0.81
28	Chemicals and Products	135.9	72	0.53
29	Petroleum and Coal Products	(12.1)	(60)	5.00
31	Leather and Leather Prod.	99.2	58	0.58
39	Miscellaneous Products	77.2	(46)	0.60
38	Instruments and Related Products	(65.5)	(33)	0.50
22	Textile Mill Products	48.5	30	0.62
25	Furniture and Fixtures	43.3	24	0.55
23	Apparel and Related Prod.	39.1	(15)	0.38
21	Tobacco Products	<u>(0.3)</u>	<u>(0.1)</u>	<u>0.35</u>
	Total	4,222.4	4822.1	1.14

() denotes estimates

Source: 1963 Census of Manufactures, U. S. Bureau of the Census,
U. S. Government Printing Office, Washington, D. C.

ECONOMIC ACTIVITY AND NON-ELECTRICAL ENERGY USAGE OF WISCONSIN

INDUSTRY

SIC	Industry	1962 Value Added (millions of 1958\$)	1962 non-electric energy use (10^9 kcal)	Energy intensiveness (10^3 kcal/\$)
26	Pulp, Paper & Products	442.1	15094	34.3
27	Food and kindred Products	678.2	8403	12.5
35	Machinery (excl. electrical)	738.7	3835	5.3
33	Primary Metals	223.7	3485	15.5
32	Stone Clay & glass products	(80.0)	(3021)	37.8
37	Transportation equipment	466.8	1930	4.3
34	Fabricated metal products	307.6	1742	5.8
36	Electrical machinery	410.0	(1031)	2.5
28	Chemicals and Products	135.9	926	6.8
29	Petroleum and coal Products	(12.1)	(816)	67.5
30	Rubber Products	77.2	(592)	7.8
31	Leather and Leather Products	99.2	590	6.0
24	Lumber and Wood Products	97.7	469	4.8
22	Textile Mill Products	48.5	228	4.8
39	Miscellaneous Products	77.2	211	2.8

SIC	Industry	1962 Value Added (millions of 1958 \$)	1962 Non electric energy use (10^9 kcal)	Energy intensiveness (10^3 kcal/\$)
25	Furniture and Fixtures	43.3	193	4.5
27	Printing and Publishing	179.3	168	1.0
38	Instruments & Related Prod.	(65.5)	(141)	2.3
23	Apparel and Related Prod.	39.1	(35)	1.0
21	Tobacco Products	(0.3)	(1)	3.3
	Total	4222.4	42910	10.3

HEAT CONTENT OF PETROLEUM PRODUCTS*

	<u>BTU/barrel</u>	<u>kcal/liter</u>
Residential type oil	6287000	9889
Distillate type oil (Diesel)	5825000	9163
Kerosine	5670000	8919
Gasoline	5248000	8255
LPG	4011000	6309

Conversion factor:

1 BTU/barrel = 0.001573 kcal/liter

HEAT CONTENT OF SOLID FUELS*

	<u>BTU/short ton</u>	<u>kcal/metric ton</u>
Coal or Lignite:		
- Electric Uti- lities	22364000	6163500
- Other Con- sumption	23750000	6545500

* From the Department of Interior - Bureau of Mines
Release dated March 10, 1973.

"1972 U.S. Energy Use Continued Upward"

HEAT CONTENT OF GASEOUS FUELS:

	<u>BTU/cubic foot</u>	<u>kcal/m³</u>
Natural gas	1031	9103

PRIMARY ENERGY CONSUMPTION FOR ELECTRICITY PRODUCTION

	<u>Primary Energy Use (kcal/lkWh of net prod.)</u>
Nuclear	2665
Hydro* (1972)	2672
Hydro (1973)	2743

* Output of hydropower converted to theoretical energy inputs calculated from state heat rates for fossil-fueled steam-electric plants in 1972 and 1973 according to WPSC Bulletin No. 8.

MEASURE OF TRANSPORT PERFORMANCE:- Person:

1 pass.-mile	1.609 pass.-km
--------------	----------------

- Freight:

1 ton-mile	1.459 ton -km
------------	---------------

MEASURE OF ENERGY INTENSIVENESS IN TRANSPORTATION:- Person:

1 BTU/pass.mile	0.1554 kcal/pass.-km
-----------------	----------------------

- Freight:

1 BTU/ton-mile	0.1714 kcal/ton-km
----------------	--------------------

MEASURE OF FUEL ECONOMY IN MOTOR VEHICLE TRANSPORTATION:

1 mile/gallon	0.4251 km/liter
---------------	-----------------

THERMAL MEASURE:

1 BTU	0.25 Kcal
-------	-----------

MEASURE OF THERMAL ENERGY CONTENT:- Liquid Fuels:

1 BTU/gallon	0.0661 kcal/liter
--------------	-------------------

1 BTU/barrel	0.001573 kcal/liter
--------------	---------------------

- Solid Fuels:

1 BTU/short ton	0.2756 kcal/metric ton
-----------------	------------------------

- Gaseous Fuels:

1 BTU/ cubic foot	8.829 kcal/m ³
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MEASURES AND CONVERSION FACTORS:- Linear Measure:

1 foot 30.48 cm

1 mile 1.609 km

- Square Measure:

1 sq. foot 929.029 cm²

1 sq. mile 2.59 km²

- Cubic Measure:

1 cubic foot 0.02832 m³

- Measure of Capacity (liquid):

1 gallon 3.7853 liter

1 barrel petroleum 158.97 liter

- Measure of Weight:

1 pound 453.59 g

1 short ton 907.185kg

GNP

NNP

OTHER SECTORS

AGRICULTURE

INDUSTRY

MILLION MARK

300

250

200

150

100

50

1950

1955

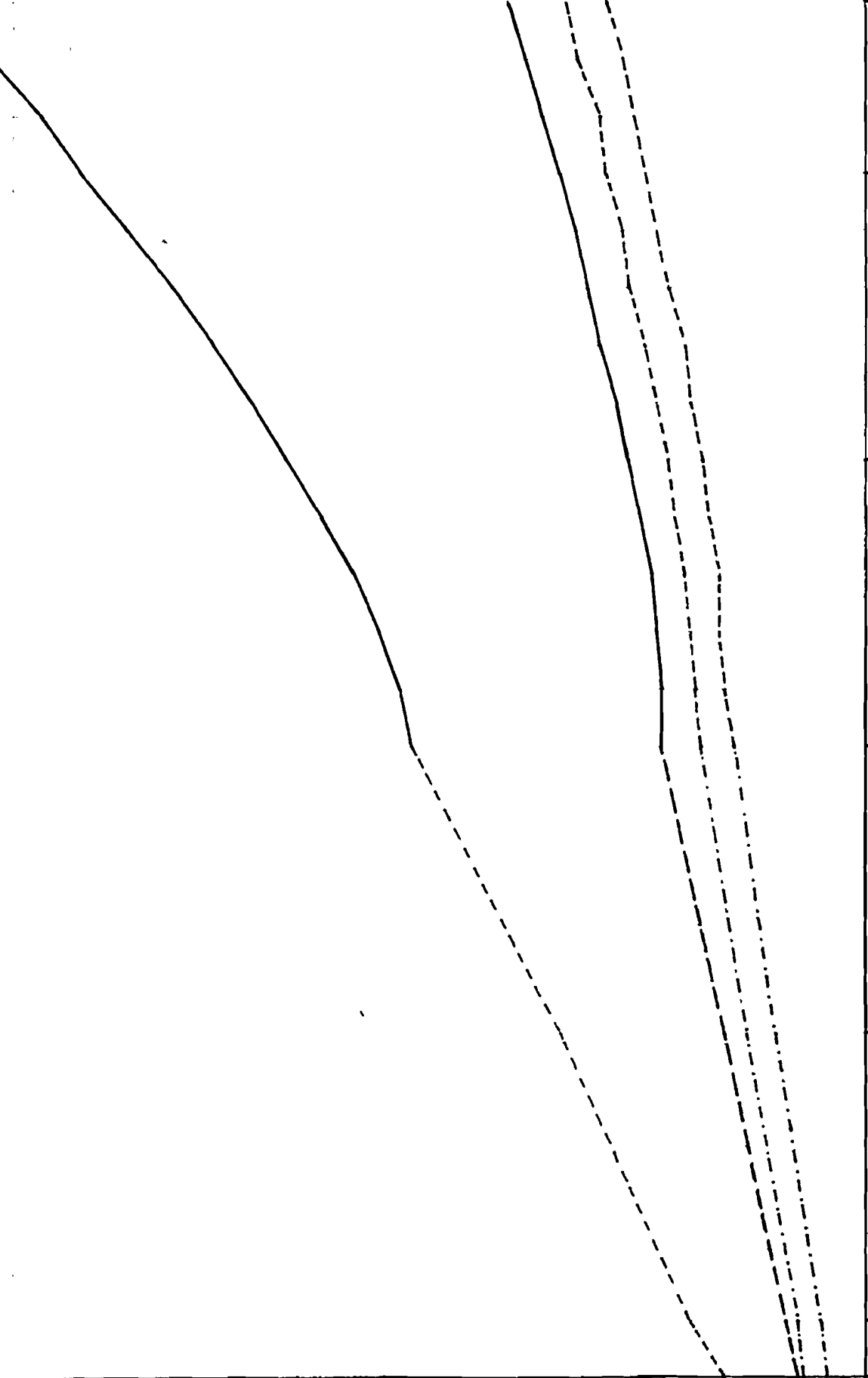
1960

1965

1970

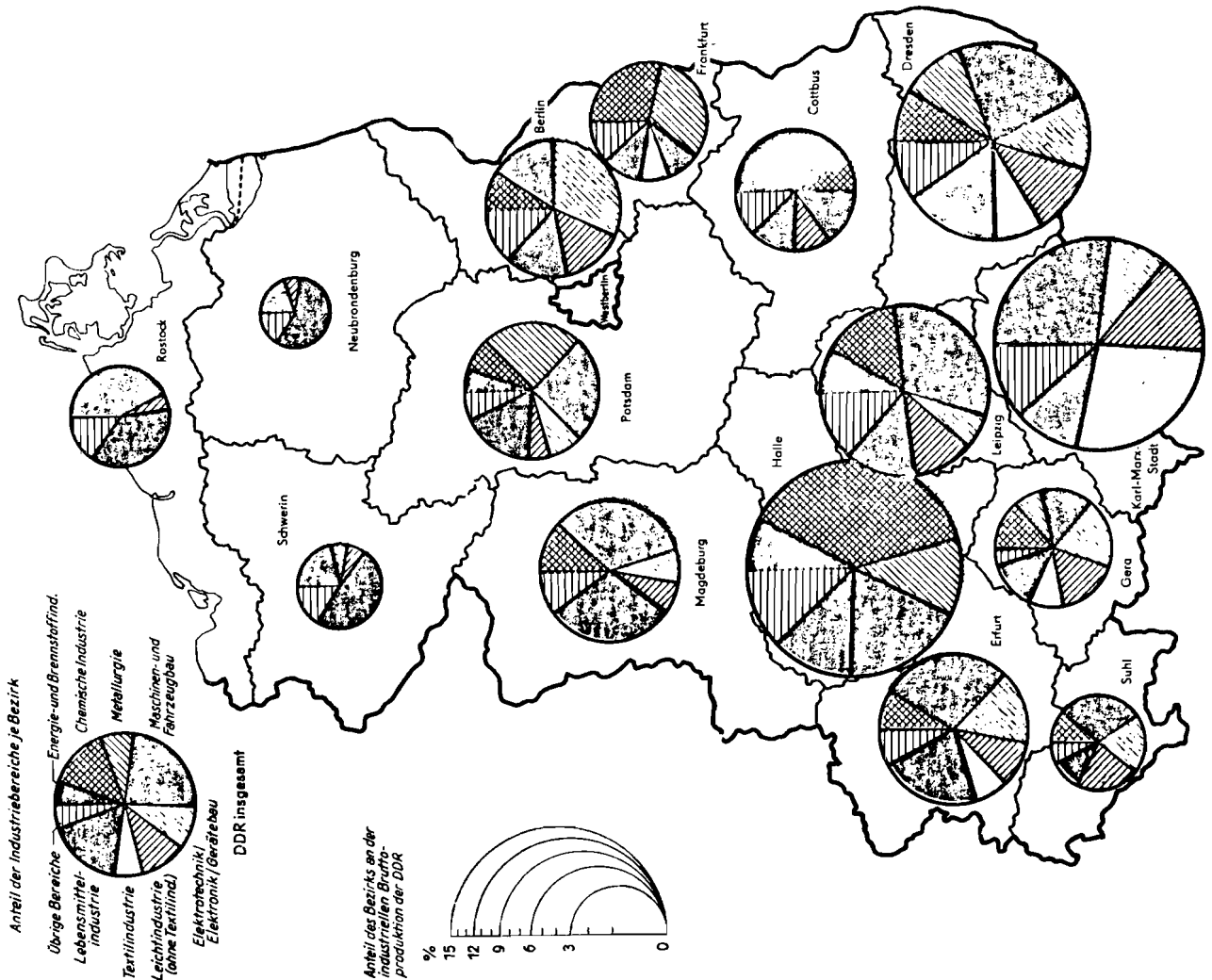
1973

GDR - NATIONAL GROSS AND NET PRODUCT



Anteil der Industriebereiche an der industriellen Bruttoproduktion des Bezirks

1972



INDUSTRIAL GROSS PRODUCTION OF GDR - REGIONS BY INDUSTRY GROUP, 1972.

Industry Groups:

- "Energie - und Brennstoffindustrie"
Energy - related industry
- "Chemische Industrie"
Chemicals, Rubber, Petroleum
- "Metallurgie"
Primary Metal Industries
- "Baumaterialienindustrie"
Stone, clay, glass, lime, concrete
- "Maschinen und Fahrzeugbau"
Machinery and Transportation Equipment
- "Elektrotechnik/Elektronik/Gerätebau"
Electrical Equipment and Instruments
- "Leichtindustrie"
Paper & pulp, printing and publishing,
lumber & wood products, furniture &
fixture, leather & leather products, apparel, etc.
- "Textilindustrie"
Textile Mill Products
- "Lebensmittelindustrie"
Food and kindred products.

Employment in the GDR by economic sectors 1968 - 1972

Sector	1968	1972	Change 68-72	Change per year
Agriculture	243900	242200	- 0.7%	- 0.2%
Industry	2812700	2992600	+ 6.4%	+ 1.6%
Handicraft	150000	136700	- 8.9%	- 2.3%
Buildings	389700	457200	+17.3%	+ 4.1%
Transport, Postal ser- vice,	535600	569400	+ 6.3%	+ 1.6%
Commerce	795200	775800	- 2.4%	- 0.6%
Other pro- ductive sectors	161000	208000	+29.2%	+ 6.6%
Non-pro- ductive sectors	1223500	1325300	+ 8.3%	+ 2.0%
Total	6311700	6701100	+ 6.3%	+ 1.5%

Employment in the GDR - Industry by Industry Group

	No. of employees (1973)	% of all industry
Energy - related Industry	190894	6.3%
Chemical Industry	333129	11.0%
Primary Metal Industry	123783	4.1%
Stone,Clay,Glass	92046	3.0%
Water	19703	0.7%
Machinery and Transport,Equip- ment	259299	28.4%

	No. of employees (1973)	% of all industry
Electrical Equip- ment and Instru- ments	420769	13.9%
"Light" Industry (except textiles)	503277	16.6%
Textiles	248343	8.2%
Food	238902	7.9%
Total	3030145	100.0%

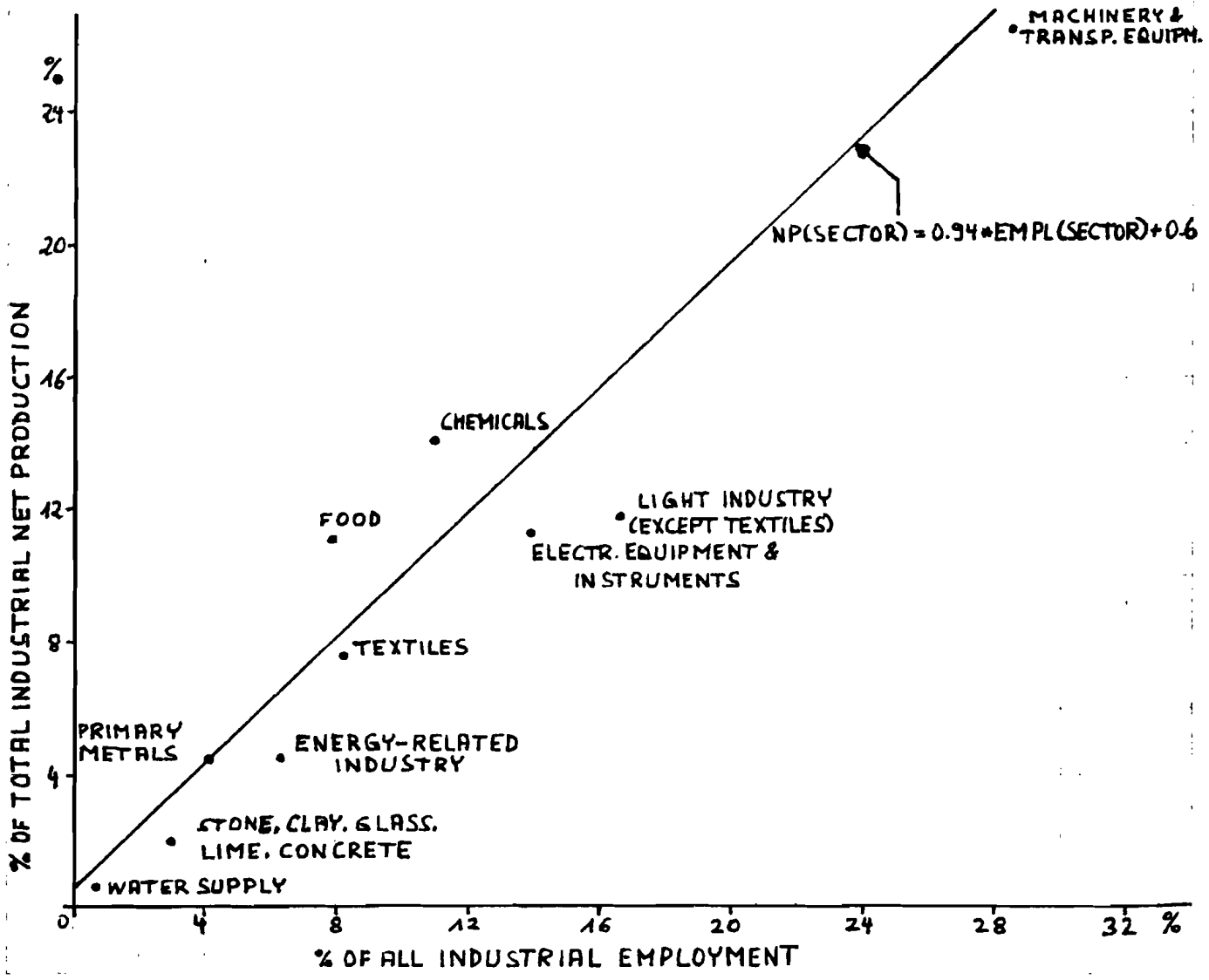
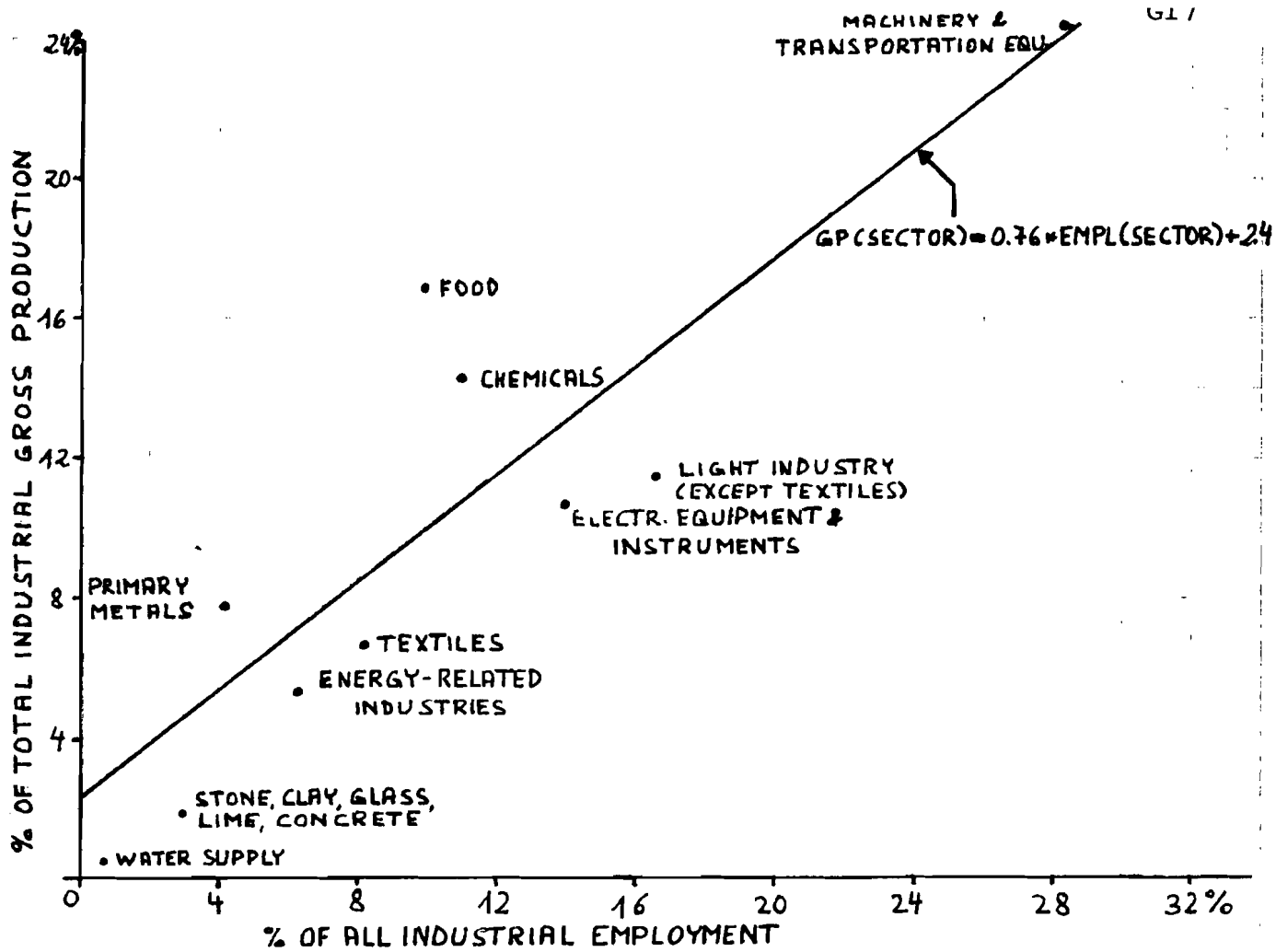
GDR - INDUSTRIAL EMPLOYMENT AND GROSS PRODUCTION BY SECTOR (1973)

Sector	Employees	Ind. Gross Prod. (1000 Mark kP ₆₇)	Employees	Indust. gross production
			Percent of total	
Energy - related Industry	190894	9588160	6.3	5.4
Chemicals (and rubber)	333129	25580476	11.0	14.3
Primary Metal Industry	123783	13975767	4.1	7.8
Stone, clay and glass products	92046	3476680	3.0	1.9
Water supply	19703	858370	0.7	0.5
Machinery and trans- port Equipment	859299	43719485	28.4	24.4
Electrical equipment and industry	420769	19098616	13.9	10.7
Light Industry (ex- cept textiles)	503277	20518942	16.6	11.5
Textiles	248343	11929689	8.2	6.7
Food	238902	30202714	7.9	16.9
Total	3030145	178948899	100.0	100.0

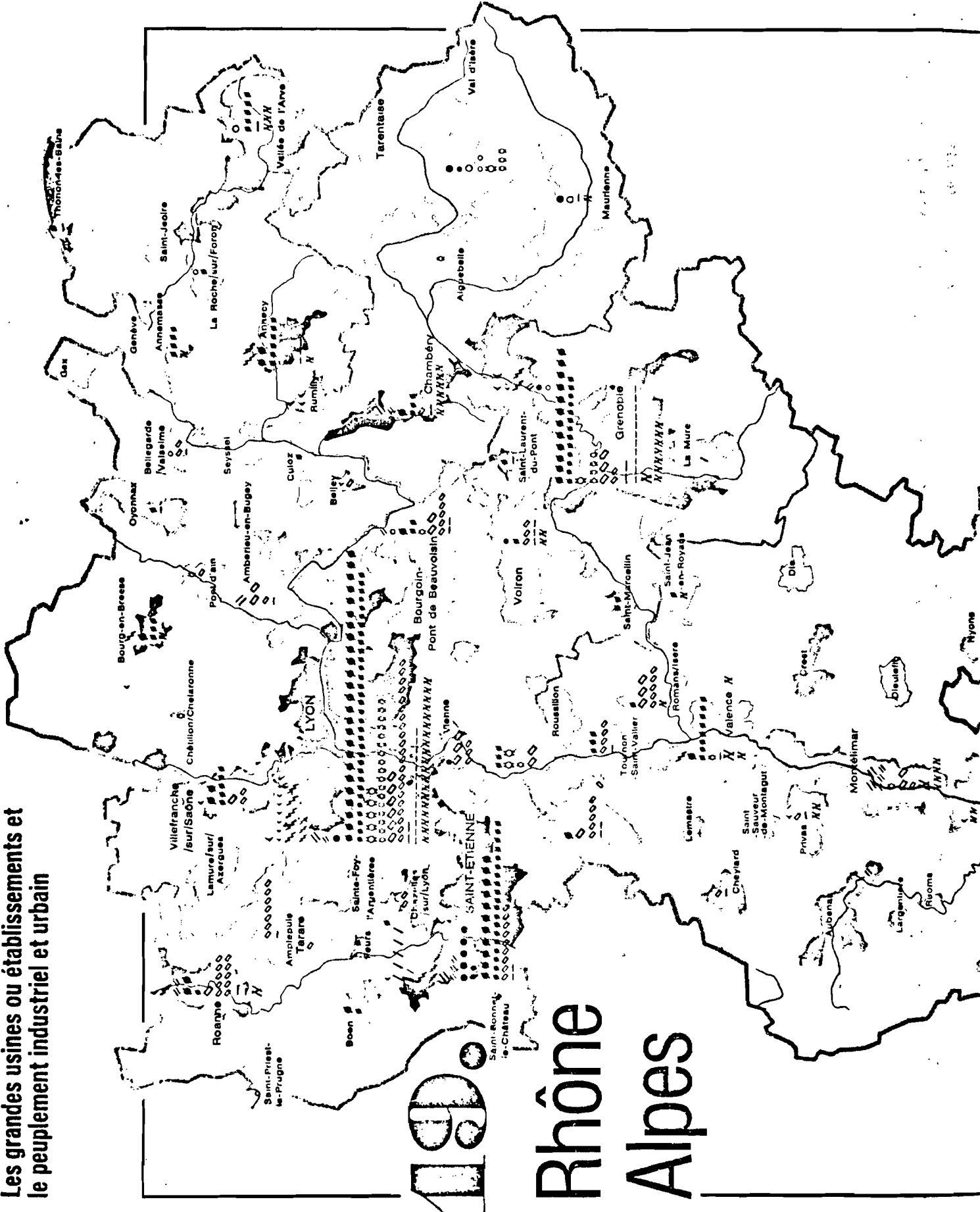
GDR - INDUSTRIAL GROSS PRODUCTION AND NET PRODUCTION BY SECTORS (1972)

Industry Group	Gross production	Depreciations		Net production (% of gross production)	Net production (% of total net production)
		Plant equipment	Material, labor force		
Energy - related Industry	5.4	14.2	56.1	29.7	4.5
Chemicals (and rubber)	14.3	6.2	53.7	40.1	16.1
Primary Metal Industries	7.8	4.5	74.5	21.0	4.5
Stone, clay, glass products	1.9	8.9	54.8	36.3	2.0
Water supply	0.5	37.8	28.0	34.2	0.6
Machinery and Transport equip.	24.4	3.1	58.5	38.4	26.6
Electrical equip., Instruments	10.7	3.3	53.1	43.6	13.3
Light Industry (except textiles)	11.5	2.8	54.8	42.4	13.8
Textiles	6.7	2.9	56.8	40.3	7.6
Food	16.9	1.6	75.6	22.8	11.0
Total	100.0			35.0	100.0

GDR - INDUSTRIAL EMPLOYMENT AND INDUSTRIAL PRODUCTION, 1972



Les grandes usines ou établissements et le peuplement industriel et urbain



RD

Rhône
Alpes

RHÔNE ALPES INDUSTRIAL PRODUCTIONPrimary Metal Industries

<u>N.A.E. Code</u> ¹⁾	<u>Activity</u>
16	Steel Production
171	Aluminium Production
172	Production of ferro-alloys

Total Production:

Activity	Unit	1966	1970	1971	1972	% of total of France ²⁾
16	10 ³ t	585.2	775.0	664.0	736.0	3.1
171	10 ³ t	145.0	153.0	145.0	150.0	37.8
172	10 ³ t	149.0	230.0	236.0	219.0	55.6

Fabricated Metal Products and Machinery

<u>N.A.E. Code</u>	<u>Activity</u>
208-1	Fabrication of water turbines
208-5	Fabrication of water pipes
213-31 to 213-37	Fabrication of mechanical tools ¹⁾
220-0	"Mécanique générale"
232-	Cutting machinery
236-2, 236-3	Fabrication of tools (implements)

1) N.A.E. ... "Nomenclature des Activites Economiques" de l'Institut National des Statistiques et des Etudes Economiques" (I.N.S.E.E.), Paris.

2) Refers to 1972 production. The same holds for the next tables too.

Activity	Unit	1966	1970	1971	1972	% of total of France
208-1	10 ⁶ F	90.9	117.9	96.2	108.2	78.9
208-5	10 ⁶ F	53.7	87.8	87.1	99.6	25.6
213-31 to 213-37	10 ⁶ F	170.0	223.3	313.0	340.0	39.8
220-0	10 ⁶ F	287.5	463.3	424.8	448.1	18.6
232-	10 ⁶ F	396.0	567.8	549.4	605.8	54.7
236-2, 236-3	10 ⁶ F	129.5	Dis- closed	Dis- closed	193.8	31.0
Total	10 ⁶ F	1127.6			1795.5	

Transportation Equipment:

N.A.E. Code

Activity

261	Construction of motor vehicles
262	Motor vehicles "bodyworks"
265	Accessories for cycles and motor cycles
266-2	Fabrication of cycles

Activity	Unit	1966	1970	1971	1972	% of total of France
261	10 ⁶ F		1759.0	2042.0	1790.0	5.7
262	10 ⁶ F	192.0		262.6	313.1	9.4
265	10 ⁶ F	69.7	138.3	152.7	223.7	26.1
266-2	10 ⁶ F	14.5	17.1	22.9	28.9	6.8
Total	10 ⁶ F			2480.4	2355.7	

Electrical Equipment and Instruments.

<u>N. A. E. Code</u>	<u>Activity</u>
28	Construction of Electrical Equipment
292	Weighing equipment
293-1 to 293-4	High precision optical instruments
296	High precision slide bearings

Activity	Unit	1966	1970	1971	1972	% of total of France
28	10 ⁶ F	2334.0	3282.8	3617.9	3943.9	9.8
292	10 ⁶ F	47.6	66.4	92.7	90.3	34.7
293-1 to 293-4	10 ⁶ F	118.0	221.8	Dis- closed	226.2	21.0
296	10 ⁶ F	229.0	295.0	316.6	288.4	23.9
Total	10 ⁶ F	2728.6	3866.0		8798.8	

Stone, Clay and Glass Products

<u>N.A.E. Code</u>	<u>Activity</u>
301-2, 301-4	Glass (mechanical, technical)
325-0	Fabrication of lime and concrete

Activity	Unit	1966	1970	1971	1972	% of total of France
301-2, 301-4	10 ³ t	302	369	389	413	18.4
325-0	10 ³ t	3846	4219	4002	4298	13.7

Chemicals and Rubber Products

<u>N.A.E. Code</u>	<u>Activity</u>	<u>Index (base:1966)</u>
351, 352, 353	Inorganic chemicals	197
354 to 358	Organic chemicals	231
360 to 369	"Parachimie"	154
37	Rubber	104

No absolute figures on the production; only indices are given.

Textile Mill Products, Apparel

<u>N.A.E. Code</u>	<u>Activity</u>
472-5, 474-5, 474-7	Cloth mills (cotton and flax)
475-5	Cloth mills (wool)
476	Cloth mills (silk)
477-1, 477-2	Fabrication of artificial silk fibres and cloth mills
481	Knitted goods
482	Fabrication of elastic textiles
484-7	Fabrication of braids and laces
49	Apparel

Activity	Unit	1966	1970	1971	1972	% of total of France
472-5, 474-5, 474-7	10 ³ t	17	12	11	12	5.8
475-5	10 ³ m		2227	1788	2116	2.0
476	10 ³ t	450	609	654		≈100.0
477-1, 477-2	10 ³ t	107	121	128	140	37.2
481	10 ⁶ F	737.3	755.8	860.8	986.0	15.8
482	10 ⁶ F	113.0	111.8	125.4	128.2	39.1
484-7	10 ³ F	40.2	39.2	43.9	42.1	33.6

Leather and Related Products

<u>N.A.E. - Code</u>	<u>Activity</u>
50	Peltry
511	Tanning
513	Leather gloves
514	Other leather goods
521, 522	Fabrication of shoes

Activity	Unit	1966	1970	1971	1972	% of total of France
511	10 ⁶ F		181.5	206.8	211.3	21.9
513	10 ³ pr.	1204	593	498	649	3.7
514	10 ⁶ F		115.2	126.1	132.1	15.1
521,522	10 ³ pr	8576	13013	13377	11456	4.8

Paper and Related Products

<u>N.A.E. - Code</u>	<u>Activity</u>
541 - 0	Fabrication of pulp
543 - 0	Fabrication of paper and cartoon

Activity	Unit	1966	1970	1971	1972	% of total of France
541 - 0	10 ³ t	126	143	126	126	6.5
543 - 0	10 ³ t	543	692	682	705	15.6

Jewelry and Goldsmithworks (N.A.E. - Code 56)

Activity	Unit	1966	1970	1971	1972	% of total of France
56	10 ⁶ F	184.2	190.6	243.5	288.8	18.8

Other activities mentioned without any reports on production:

- food and kindred products (N.A.E. 39 - 46)
- lumber and wood products (N.A.E. - 53)
- printing and publishing
- sport articles, games
- plastic goods
- construction of buildings, public works

Source:

Annuaire Rhône-Alpes 1974

Principaux Résultats Statistiques en 1973

Supplément de no. 9 de la revue

"Points d'Appui pour l'Économie Rhône-Alpes"

Rhône-Alpes Employment by Economic Sectors

(Estimation for 1.1.1974)

Sector	Employed	Self employed	Total	Change 68-74	Change per year
Agriculture			175450	-20.8%	- 3.8%
Food and kindred products	40129	10827	50956	+ 9.2%	+ 1.0%
Solid fuels	4081		4081	-57.7%	-13.4%
Gas,Electricity Water,etc.	14030	130	14160	- 9.1%	- 1.6%
Petroleum, natural gas, liquid fuels	4577	292	4849	+36.1%	+ 5.3%
Material for construction	16260	773	17033	+ 5.5%	+ 0.9%
Glass	8039	179	8218	+25.4%	+ 3.8%
Iron and Steel	17092	414	17506	+ 2.4%	+ 0.4%
Non-Ferrous minerals	7516		7516	- 1.1%	- 0.2%
Primary transfer of metals	65920	1939	67859	+28.2%	+ 4.2%
Machinery	131557	4327	135884	+34.0%	+ 5.0%
Electric Equip- ment	63032	809	63841	+44.1%	+ 6.3%
Auto Industry	48493	389	48882	+27.1%	+ 4.1%
Ship, aeroplane, weapons	7519	51	7570	+ 9.1%	+ 1.5%
Chemicals	50502	139	50641	+ 3.1%	+ 0.5%
Textiles	87530	4643	92173	- 5.4%	- 0.9%
Apparel	35219	2932	38151	- 0.5%	- 0.1%
Leather Industry	17452	1139	18591	-11.9%	- 2.1%
Wood and kindred products	21119	4283	25402	+ 6.1%	+ 1.0%
Paper	21938	643	22581	+19.9%	+ 3.7%
Printing and publishing	15650	1943	17593	+ 7.4	+ 1.2%
Miscellaneous Industries	46567	1480	48047	+39.2	+ 5.7%

Sector	Employed	Self employed	Total	Change 68-74	Change per year
Building and Public works	162886	29428	192314	+ 9.0%	+ 1.5%
Transport	64704	5876	70580	+11.3%	+ 1.8%
Postal service and tele- communications	32399		32339	+13.0%	+ 2.1%
Housing	5142	160	5302	-31.0%	- 6.0%
Other services	222340	60580	282920	+28.3%	+ 4.2%
Commerce	175195	58031	233226	+27.4%	+ 4.1%
Banking and Insurance	32197	249	32446	+57.7%	+ 7.9%
Public Service	153298	123	153421	+27.0%	+ 4.1%
Local control boards	45115		45115	+68.4%	+ 9.1%
Social Security	15647		15647	+24.2%	+ 3.7%
Administration & Education	29637	12342	41979	+ 9.8%	+ 1.6%
Miscellaneous Domestic Services	28494	134	28628	- 7.5%	- 1.3%
Total - Non Agricultural	1691256	204255	1895511	+18.7%	+ 2.9%
Total of all Sectors			2070961	+13.9%	+ 2.2%

RHÔNE-ALPES EMPLOYMENT, BY ECONOMIC SECTOR (ESTIMATION FOR 1.1.74)

Sector	Employment	Self employed	Total	Change 68 - 74	Change per year
Agriculture			175450	-20.8	- 3.8
Industry	724202	37332	761534	+16.7	+ 2.6
Contract buildings	162886	29428	192314	+ 2.4	+ 0.4
Transport, Postal Services, Telec.	97103	5876	102979	+11.8	+ 1.9
Other services	434874	119020	553894	+28.2	+ 4.2
Commerce					
Administration	243697	12465	256162	+29.0	+ 4.3
Other Sectors	28494	134	28628	- 7.5	- 1.3
Total non-agricultural:	1691256	204255	1895511	+19.6	+ 3.1
Total:			2070961	+14.8	+ 2.3

People employed¹⁾ in industrial production and services in
the capitals of the Rhône-Alpes "Départements"

Capital	Total	Industrial Production	Services	Unaccount- able
Lyon	311690	62.65%	36.78%	0.57%
Grenoble	90258	65.13%	34.21%	0.66%
St. Etienne	73113	71.32%	28.28%	0.40%
Valence	27132	61.00%	38.45%	0.55%
Anncy	27269	67.13%	31.85%	1.02%
Roanne	22811	76.91%	22.94%	0.11%
St. Chamond	19219	84.90%	15.06%	0.04%
Chambéry	17555	59.39%	35.90%	0.71%
Total:	589047			

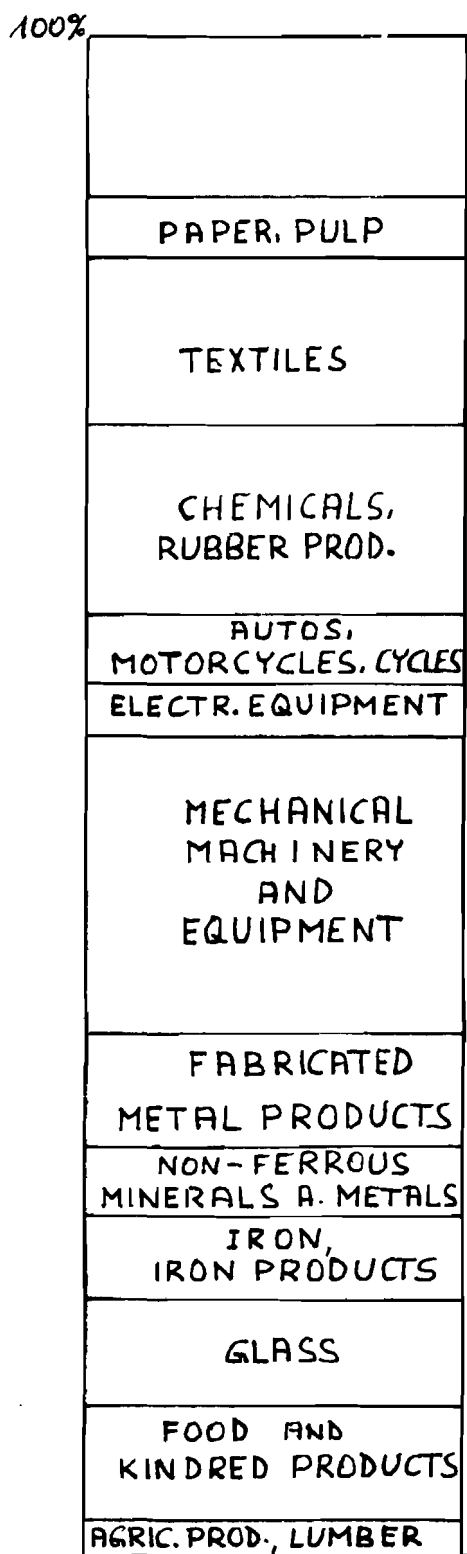
1) Only production units and utilities with more than 10 people employed are considered here.

MAIN IMPORTS TO AND EXPORTS FROM RHONE-ALPES, BY PRODUCTS, IN 1973

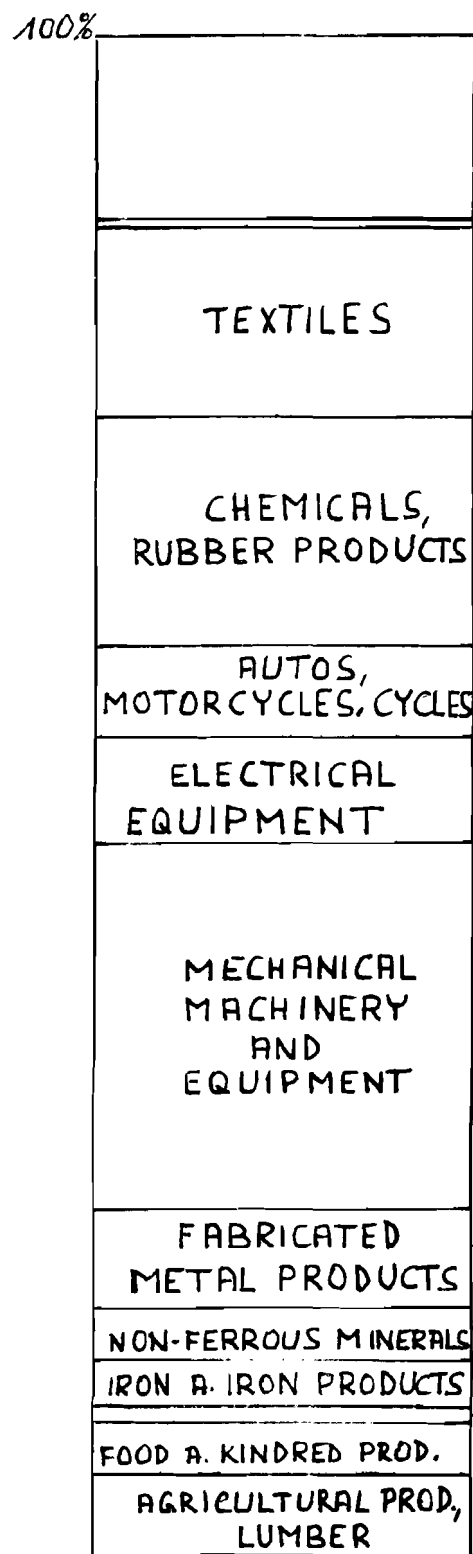
Code	Product Group	Imports		Exports			
		Gross value (10 ⁶ Francs)	% of all imports to Rhone Alpes	% of all im- ports to Fr.	Gross value (10 ⁶ Francs)	% of all exports from Rhone- Alpes	% of all exports from France
1	Agric. Prod., Lumber	262859	2.6	3.6	837782	5.4	5.6
2	Food & kindred prod.	711690	7.2	4.8	570895	3.6	3.7
8	Glass	702641	7.1	4.0	169019	1.1	10.2
9	Iron & Iron Products	564989	5.7	6.5	434508	2.8	4.9
10	Non-ferrous minerals and metals	439341	4.4	5.1	580764	3.8	14.1
11	Fabricated Metal Prod.	753231	7.6	11.2	984241	6.4	13.1
12	Mecanical Machinery & Equipment	1906394	19.2	8.1	3656808	23.7	16.6
13	Electrical Machinery & Equipment	369157	3.7	4.2	1148184	7.4	12.7
14	Autos, Motorcycles & cycles	422977	4.3	6.2	885216	5.7	4.8
16	Chemicals & Rubber Products	1271360	12.8	7.6	2360718	15.3	13.3
17	Textiles	1076578	10.8	9.4	1900844	12.3	16.8
21	Pulp, Paper & Cartoons	399418	4.0	9.7	250316	1.6	11.1
	Other products	1055774	10.6		1649445	10.7	
	Total	9936409	100.0	6.3	15428740	100.0	9.8

RATE OF EXCHANGE (ON DOLLAR - BASE)

<u>Year</u>	<u>Francs</u>	<u>Year</u>	<u>Francs</u>
1950	349.68	1960	4.9039
1951	349.96	1961	4.9052
1952	349.97	1962	4.9003
1953	349.97	1963	4.9003
1954	349.97	1964	4.9005
1955	349.97	1965	4.9012
1956	349.99	1966	4.9136
1957	349.99	1967	4.9200
1958	490.54	1968	4.9513
1959	490.53	1969	5.1991
		1970	5.5282
		1971	5.5118
		1972	5.0446



IMPORTS

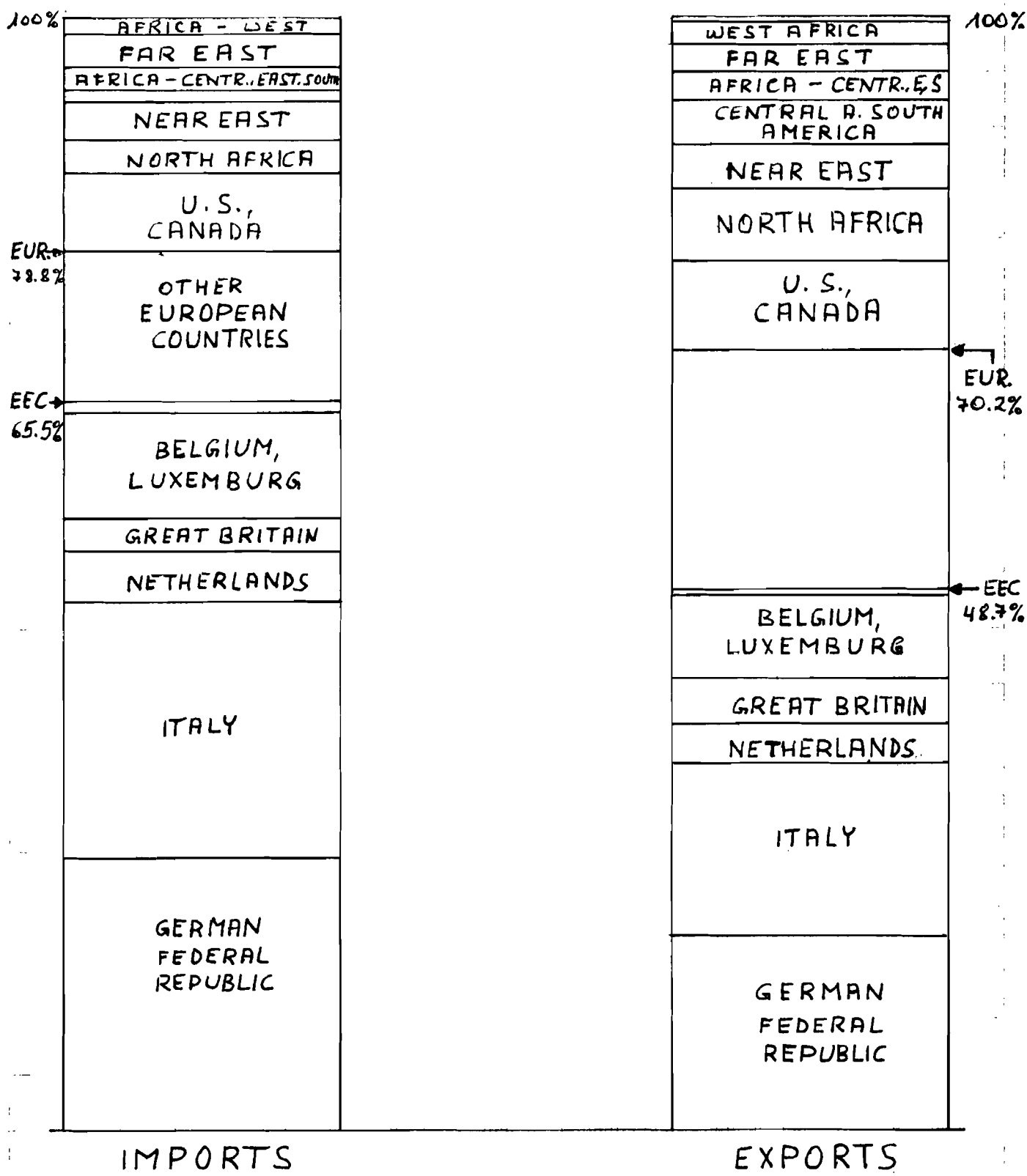


EXPORTS

RHÔNE-ALPES IMPORTS AND EXPORTS, BY PRODUCT GROUP,
1973

GEOGRAPHIC STRUCTURE OF FOREIGN TRADE OF RHONE-ALPES IN 1973

	Imports		Exports	
	Gross Value (Mill.Franc)	% of Total	Gross Value (Mill.Francis)	% of Total
<u>EEC Countries:</u>				
German Fed. Rep.	2439	24.5	2663	17.3
Italy	2274	22.9	2414	15.6
Netherlands	471	4.7	429	3.4
Great Britain	298	3.0	613	4.0
Belgium, Luxemburg	914	9.2	1176	7.6
Denmark	80	0.8	94	0.6
Ireland	38	0.4	27	0.2
<hr/>				
Total of EEC countries:	6514	65.5	7516	48.7
Other European countries:	1320	13.3	3317	21.5
America - North	705	7.1	1170	7.6
Africa - North	317	3.2	1070	6.9
Near East Countries	346	3.5	602	3.9
South & Central America	72	0.7	582	3.8
Africa - Central, East, South	219	2.2	428	2.8
Far East Countries	277	2.8	355	2.3
Africa West	145	1.5	277	1.8
Australia & Oceania	20	0.2	105	0.7
<hr/>				
Total	9935	100.0	15428	100.0



GROSS VALUE: 9,935 Million Francs GROSS VALUE: 15,428 Million Francs

RHÔNE-ALPES - REGIONAL STRUCTURE OF FOREIGN TRADE, 1973.

10⁹ FRANCS

1000

750

500

250

0

1963

1964

1965

1966

1967

1968

1969

1970

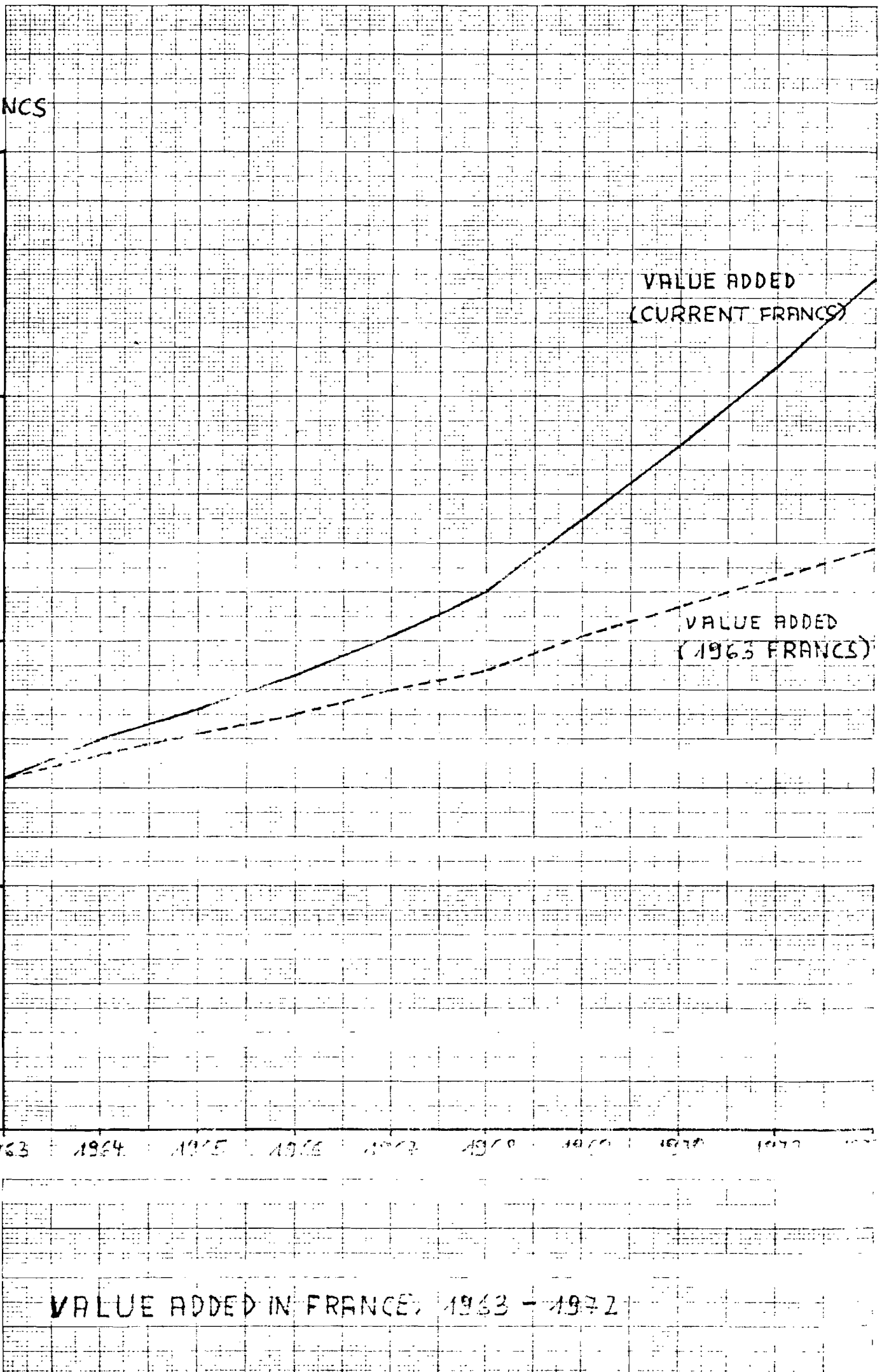
1971

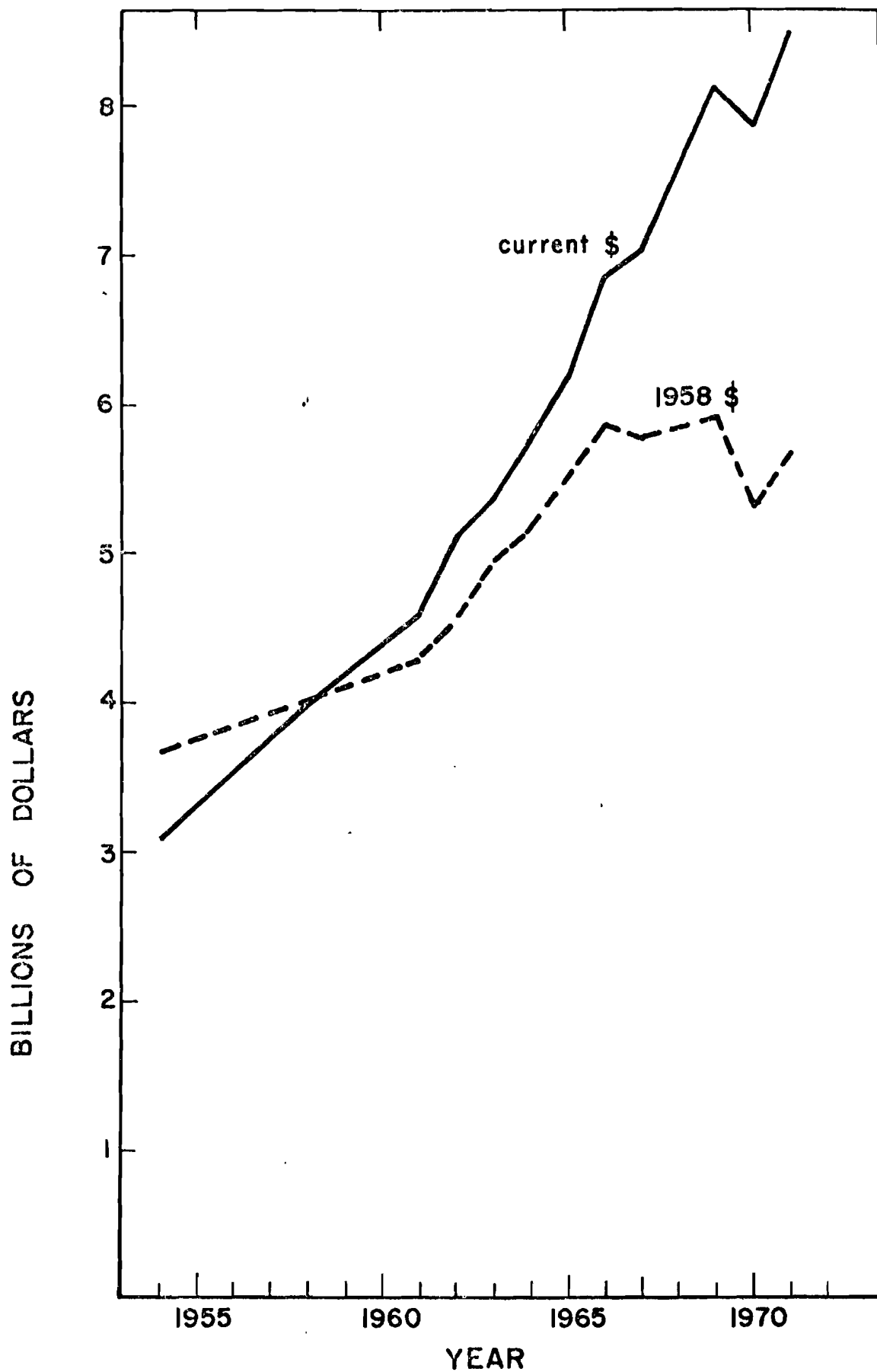
1972

VALUE ADDED
(CURRENT FRANCS)

VALUE ADDED
(1963 FRANCS)

VALUE ADDED IN FRANCE, 1963 - 1972





VALUE ADDED IN WISCONSIN MANUFACTURING

Source: U.S. Bureau of Census, Annual Survey of Manufactures

Value Added in Wisconsin Manufacture, 1970

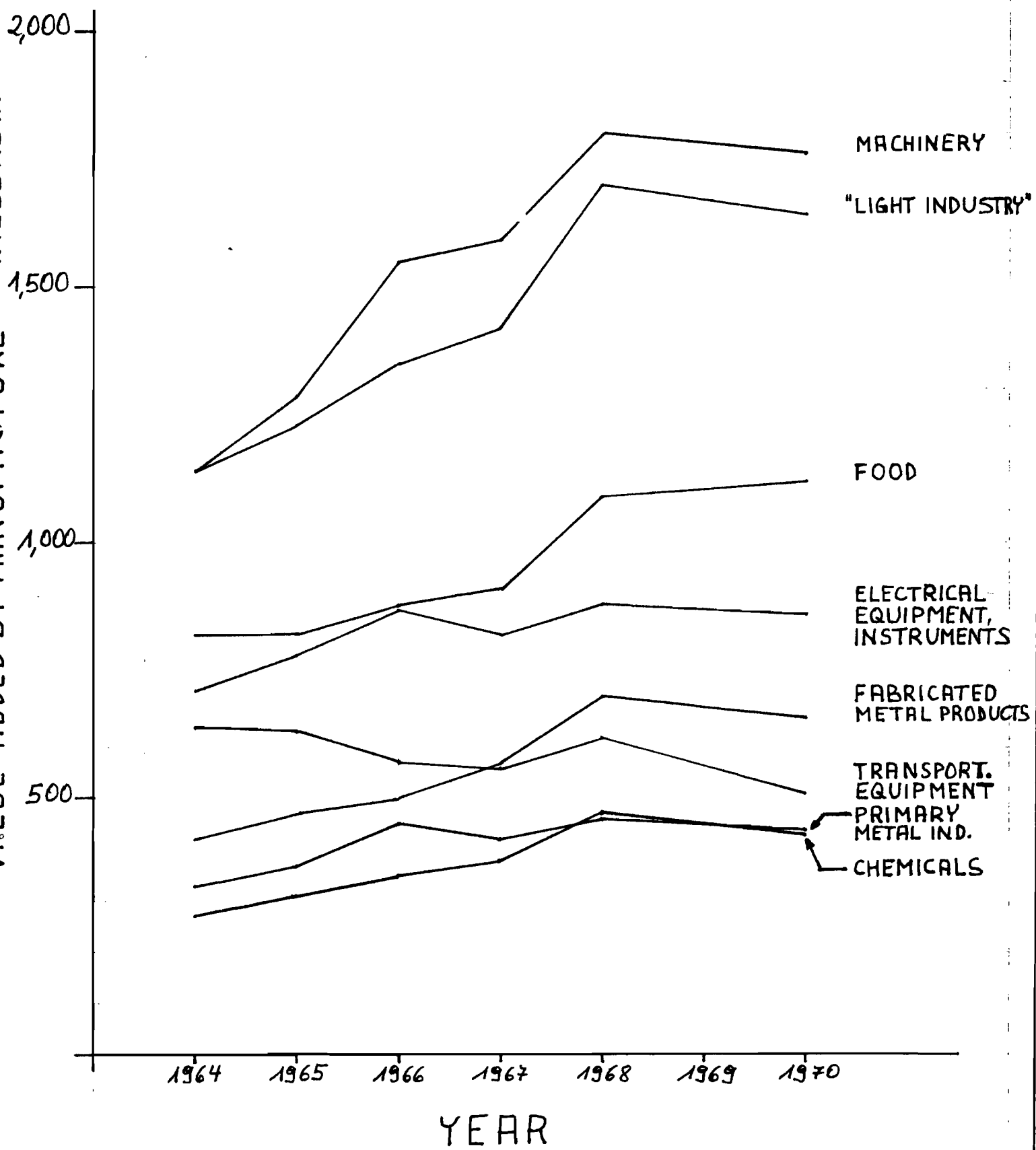
SIC		Value Added (Millions)		Percent of State Total
		Current 1970 \$	1958 \$	
35	Machinery (except Electrical)	1,763.8	1,156.6	21.9
20	Food & Kindred Products	1,118.6	748.2	14.2
26	Pulp, Paper & Products	744.7	540.2	10.2
36	Electrical Machinery	728.4	477.5	9.0
34	Fabricated Metals	663.0	419.4	7.9
37	Transportation Equipment	505.5	387.7	7.3
33	Primary Metal Industries	445.0	281.5	5.3
27	Printing & Publishing	365.3	249.9	4.7
28	Chemicals & Allied Products	279.3	226.1	4.3
30	Rubber & Plastic Products	162.2	126.1	2.4
31	Leather & Leather Products	160.8	98.8	1.9
24	Lumber & Wood Products	135.3	109.3	2.1
32	Stone, Clay & Glass Products	129.0	89.0	1.7
38	Instruments & Related Products	128.0	87.6	1.7
39	Miscellaneous Products	109.9	75.2	1.4
22	Textile Mill Products	94.5	69.8	1.3
25	Furniture & Fixtures	92.0	69.3	1.3
23	Apparel & Related Products	78.0	57.6	1.1
29	Petroleum & Coal Products	(18.0)	(14.6)	0.3
21	Tobacco Products	(0.4)	(0.3)	
	Total	7,721.7	5,284.7	100.0

Source: Annual Survey of Manufactures 1970, U. S. Bureau of the Census

() denote estimates

10⁶ \$

VALUE ADDED BY MANUFACTURE - WISCONSIN



Source:
The State of Wisconsin 1973 Blue Book.

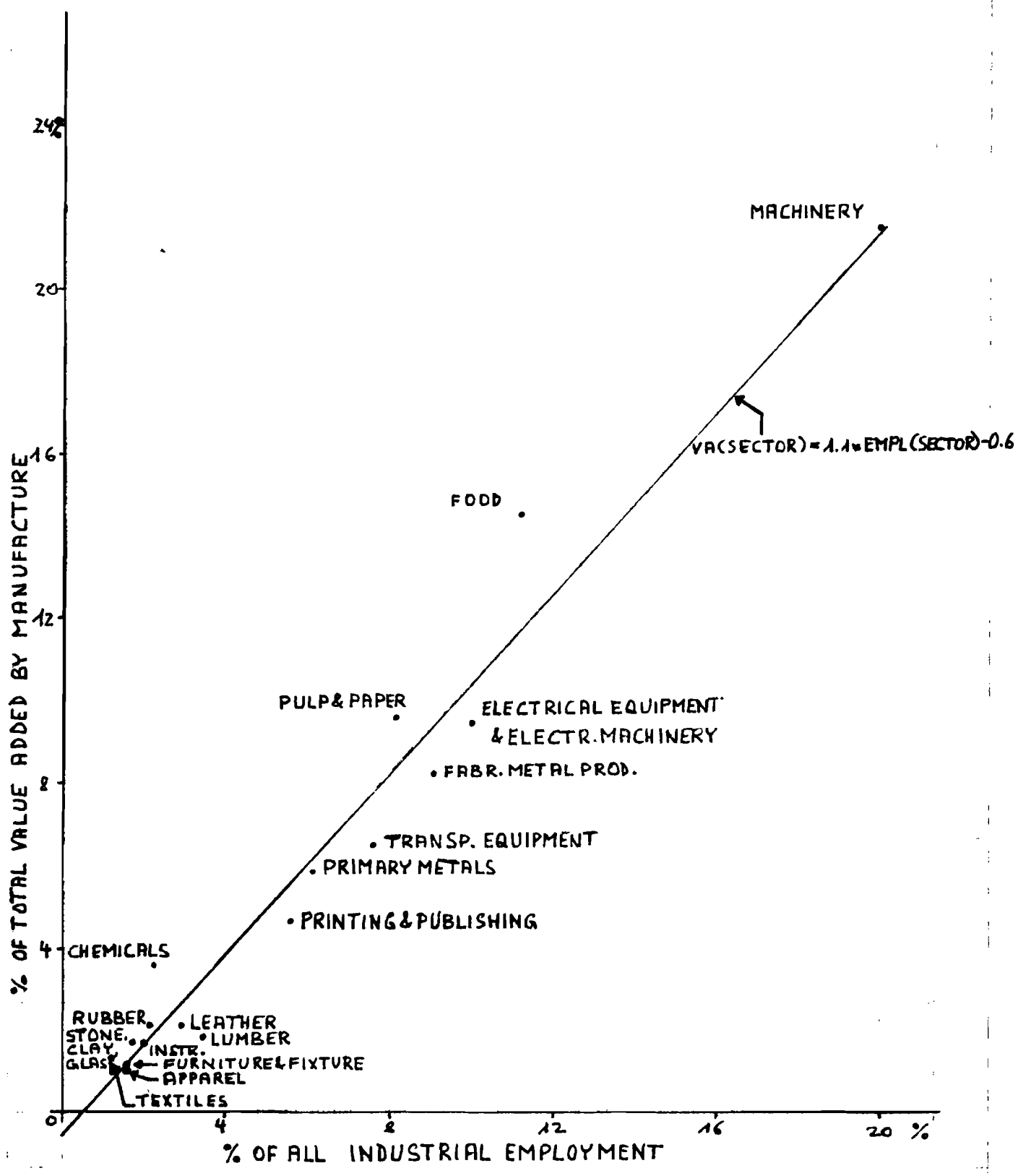
Manufacturing employees by industry group in Wisconsin,
1968, 1971

Industry Group	1968	1971	change 68 -71	change per year
Machinery, except electrical	107649	93637	-13.0%	-4.5%
Food and kindred products	55234	49962	- 9.5%	-3.3%
Electrical machinery	49945	43975	-12.0%	-4.2%
Fabricated metal products	42641	41239	- 3.3%	-1.1%
Paper and allied products	37807	36936	- 2.3%	-0.8%
Transportation equip- ment	35054	34787	- 0.8%	-0.3%
Primary Metal Industry	29624	27027	- 8.8%	-3.0%
Printing and publishing	25544	25493	- 0.2%	-0.1%
Administrative and delivery	20986	21280	+ 1.4%	+0.5%
Lumber and wood pro- ducts	17033	15106	-11.3%	-3.9%
Leather and leather products	15044	12526	-16.7%	-5.9%
Chemical and allied products	10803	10252	- 5.1%	-1.7%
Rubber and plastics products	9347	10086	+ 7.9%	+2.6%
Instruments and related products	9966	9069	- 9.0%	-3.1%
Miscellaneous manu- facturing	9784	8629	-11.8%	-4.1%
Stone, clay and glass products	7754	7483	- 3.5%	-1.2%

<u>Industry Group (cont'd)</u>	<u>1968</u>	<u>1971</u>	<u>change 68 - 71</u>	<u>change per year</u>
Furniture and fixtures	6813	7134	+ 4.7%	+1.5%
Apparel and related products	7904	6875	-13.0%	-4.5%
Textile mill products	6117	5911	- 3.4%	-1.1%
Ordinance and acces- sories	-	-		
Petroleum and coal products	-	-		
TOTAL:	510495	471042	- 7.7%	-2.6%

Employment in Wisconsin by Sector, 1968, 1971

Sector	1968	1971	Change 68-71	Change per year
Manufacturing	507600	478400	- 5.8%	-2.0%
Wholesale and retail trade	308800	333500	+ 8.0%	+2.6%
Government	243200	270200	+11.1%	+3.6%
Service and Misc.	206000	236600	+14.9%	+4.7%
Transportation and public utilities	76900	80900	+ 5.2%	+1.7%
Contract construction	66000	61400	- 7.0%	-2.4%
Finance, Insurance and real estate	56500	61800	+ 9.4%	+3.0%
Mining	2500	2400	- 4.0%	-1.4%
Other non-farm	142200	144000	+ 1.3%	+0.4%
Farm	170400	158700	- 6.9%	-2.3%
Total non-farm employ- ment	1609700	1669200	+ 3.7%	+1.2%
Total employment	1780100	1827900	+ 2.7%	+0.9%



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