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CANADA

CANADA'S CHANGING ENERGY PATTERN

SEASONALLY ADJUSTED
ECONOMIC INDICATORS



Special Reprint from The Canadian Statistical Review, July, August, October, 1957

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QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1957

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PART I - *The Supply and Distribution of Individual Commodities in 1952*

This is the first of three articles on the supply and distribution of energy in Canada, based on a new method that has been developed for the presentation of the statistics in this field. The year 1952 was chosen because it is the last year for which a complete study is available. All data in this article are given in terms of weight, volume or kilowatt hours. The second article will present many of the 1952 data in terms of a common unit of measurement, the British thermal unit. On this basis, it is possible to assess the relative importance of the different commodities which make up Canada's energy pattern. The final article will take several of the leading concepts covered by the first two articles, and will show the changes over time, from 1926 where possible, up to the latest date for which figures can be computed. Statistics presented in the second and third articles will fit into the framework of the main table presented here for the year 1952.

The table on pages II and III shows the supply and distribution of energy in Canada in 1952, and a brief description of it is given in the following paragraphs. Full details on the way in which the table was built up, together with a detailed explanation of the concepts used, are contained in Reference Paper Number 69 "*Energy Sources in Canada; Commodity Accounts for 1948 and 1952*". Available data for earlier years are given in Reference Paper Number 74, "*Energy Sources in Canada; Commodity Statements for 1926, 1929, 1933 and 1939*".

The Method of Approach

For the purpose of this study, the fuels used in Canada were broken into commodity groups as finely as the available data permitted. Each commodity group has a column in the consolidated table, as does electricity. For 1952, it was not possible to break out the electricity completely between that generated by water and that generated by thermal plants, although such a breakdown would be preferable. Reference Paper Number 69 gives (page 15) sufficient information for an estimate to be made with reasonable accuracy for most economic purposes.

For each commodity group, a series of data are given, which demonstrate where the available supply came from, and how it was used. The available supply in Canada is taken to be the amount produced within the country plus the excess of imports over exports (net imports) plus the net amount withdrawn from stocks during the year. In cases where stocks were built up during the year, the change in stocks is given as a negative quantity.

The use of net imports is satisfactory for an aggregative approach, but more detail is needed, of course, to give the full picture of the impact of international trade on the Canadian energy pattern. For 1952, when exports of fuel were comparatively unimportant, the use of net imports does not obscure a broad view of the international aspect. However, it could be less satisfactory for a year in which there were heavy imports and exports of the same commodity. In 1956, for instance, a statement of net imports of crude petroleum might be somewhat misleading, because in that year there were heavy exports from western Canada, simultaneously with heavy imports to eastern Canada. A similar table for 1956 might, therefore, need to be presented somewhat differently.

Having worked out the available supply, the next step was to account for its use. The total accounted for is given as line 6 of the table. Line 5, use unaccounted for, is a balancing item obtained by subtracting the use accounted for from the available supply.

To some extent, waste can be accounted for. Measured waste is stated on line 7, and the deduction of it from use accounted for leaves use accounted for net of waste, on line 8.

Because one purpose of this study was to determine the net use of energy, it was necessary to break out separately the amounts of fuel and electricity used in the process of producing other units of fuel and electricity. Lines 9 to 17 give information about these. Deduction of the amounts used within the energy-producing sector gives, at line 18, the amount used outside the energy-producing sector, as far as this was measured. The next step is to deduct the amount of fuel commodities used as raw materials. Finally, line 20 shows the total amount of fuel or electricity used to supply energy outside the energy-producing sector. Lines 21 to 27 break this total down between the more important categories of end use.

The statistical gap - One advantage of the consolidated table is that it provides a check on the cover of the statistical system, and to some extent on its quality. The total for supply available in Canada should theoretically be the same as that for use accounted for, including waste. Under the conditions of actual measurement, there is a difference, usually in the form of a shortfall of measured distribution below the apparent supply. For all the commodities covered, this supply figure can be

Supply and Distribution of Fuel and Electricity in Canada, 1952

No.		Coal (excluding briquettes)	Coal briquettes	Crude petroleum	Natural gas
		(tons)	(tons)	(thousands of imperial gallons)	(thousands of cubic feet)
1	Production in Canada	17,579,002	711,093	2,163,602	105,364,486 ²
2	Net imports	24,040,264	155,343	2,869,935	-2,163,607
3	Net decrease in measured stocks	-227,557	-8,532	-114,677	-3,536,353
4	Apparent supply available in Canada	41,391,709	857,904	4,918,860	99,664,526
5	Use unaccounted for	1,139,193	51,767	21,844	-329,290
6	Use accounted for in Canada including waste	40,252,516	806,137	4,897,016	99,993,816
7	Waste accounted for	550,506	-	1,520	16,678,023
8	Use accounted for in Canada, net of waste	39,702,010	806,137	4,895,496	83,315,793
9	Use accounted for in manufacture of fuel or electricity	7,831,248	-	4,885,440	15,708,444
10	(1) coal mining	435,686	-	-	-
11	(2) coal briquette plants at mines	628,606	-	-	-
12	(3) natural gas	-	-	-	-
13	(4) crude oil	-	-	499	3,249,687 ³
14	(5) coke and gas	5,459,354	-	-	-
15	(6) petroleum refining	-	-	4,884,941	7,693,301
16	(7) central electric stations	1,307,602	-	-	4,765,456
17	(8) other	-	-	-	-
18	Measured portion of use outside the energy-producing sector	31,870,762	806,137	10,056	67,607,349
19	Measured portion of use as raw materials	165,729	-	-	- ⁴
20	Measured portion of use as fuel or electricity outside the energy-producing sector	31,705,033	806,137	10,056	67,607,349
21	(1) households	-	-	-	28,392,449
22	(2) commercial	11,019,705	291,407	-	14,935,855
23	(3) manufacturing	-	-	-	-
24	(4) mining	10,064,464	-	-	22,677,481 ⁴
25	(5) transportation	10,620,864	514,730	10,056	1,347,876
26	(6) other	-	-	-	126,500 ⁵
27	(7) non-assignable	-	-	-	127,188 ⁶

1. Some industrial use may have been recorded as bituminous coal.
2. Includes waste gas.
3. Includes lease fuel, in Alberta.
4. Use as raw material is included with consumption by manufacturing and mining.
5. Used by private well owners in Ontario.
6. Miscellaneous sales by distributors.

Supply and Distribution of Fuel and Electricity in Canada, 1952

Coke (except petroleum and pitch coke)	Petroleum coke	Manufactured gas ⁷	Liquefied petroleum gases	Gasoline and naphtha	Other petroleum fuels	Fuelwood and wood waste usable as fuel	Electricity	No
(tons)	(tons)	(thousands of cubic feet)	(thousands of imperial gallons)	(thousands of imperial gallons)	(thousands of imperial gallons)	(cords)	(thousands of kilowatt hours)	
4,056,655	203,388	98,297,792	37,449	2,073,188	2,294,472	6,104,104	66,100,534	1
235,314	229,622	—	37,694	201,025	792,950	-14,857	-2,473,225	2
-794	19,100	—	-197	35,729	-82,238	—	—	3
4,291,175	452,110	98,297,792	74,946	2,309,942	3,005,184	6,089,247	63,627,309	4
108,614	29,870	2,568,604	61,108	-50,244	165,035	5,723,834	1,909,808	5
4,182,561	422,240	95,729,188	13,838	2,360,186	2,840,149	365,413	61,717,501	6
—	—	—	—	45,759	—	—	—	7
4,182,561	422,240	95,729,188	13,838	2,314,427	2,840,149	365,413	61,717,501	8
330,980	52,638	34,579,023	13,438	908	228,547	—	621,076	9
—	—	—	—	—	—	—	292,696	10
—	—	—	—	—	—	—	—	11
—	—	—	—	—	—	—	1,583	12
—	—	—	—	—	—	—	15,605	13
330,980	—	15,116,728	13,333	—	20,764	—	62,614	14
—	52,638	19,462,295	105	898	171,832	—	248,678	15
—	—	—	—	10	35,344	—	—	16
—	—	—	—	—	607	—	—	17
3,851,581	369,602	61,150,165	400	2,313,519	2,611,602	365,413	61,096,425 ⁸	18
2,790,415	366,212	—	—	12,073	2,025	364,455	—	19
1,061,166	3,390	61,150,165	400	2,301,446	2,609,577	958	61,096,425	20
} 428,315	3,390	16,417,482	—	—	} 1,220,237	—	8,741,182	21
		6,109,610	—	—		—	3,489,248	22
		38,081,994	—	—		—	38,550,813 ⁸	23
632,851	—	—	—	—	622,108	—	2,632,464 ⁸	24
—	—	43,987	400	2,122,397	741,673	958	6,466,778 ⁹	25
—	—	—	—	—	—	—	1,144,363 ¹⁰	26
—	—	497,092	—	179,049	25,559	—	71,577 ¹¹	27

7. Excludes blast furnace gas.

8. Includes thermal electricity generated by manufactures and mines for own use.

9. Includes line losses.

10. Street lighting and municipal power.

11. Free service.

assumed to be reasonably reliable. Information on the change in inventories is sometimes incomplete, but this item is probably never more than a small part of the total supply. The statistical gap is therefore best measured as the percentage by which the measured portion of consumption falls short of the apparent available supply. The table below shows this statistical gap, ranking the commodities according to the size of the gap, irrespective of sign.

Energy Account, 1952

Per cent by which measured portion of distribution fell short of apparent available supply.

Natural gas	0.33
Crude petroleum	0.4
Gasoline and naphtha	2.2
Coke (other than petroleum or pitch coke)	2.5
Manufactured gas	2.6
Coal (excluding briquettes)	2.8
Electricity	3.0
Other petroleum fuels	4.7
Coal briquettes	6.0
Petroleum coke	6.6
Liquefied petroleum gases	81.5
Fuelwood	94.0

The first point which springs to mind is that the degree of cover was quite high in 1952, 93.4 per cent or more of the supply being accounted for on the distribution side for ten of the commodity groups, including all the major ones. Most of the fuelwood unaccounted for was used by households for heating or cooking. Studies have shown that there was a considerable increase in cover for most fuels between 1939 and 1948. This was due to wartime controls and the consequent need for additional information.

The Supply and Distribution of Individual Commodities

The consolidated table shows a varying pattern of supply and distribution for the different sources of energy. An outline of the main features for each commodity group is given below.

Coal (excluding briquettes) - It is clear from the table that Canada was dependent on imports for the greater part of her coal supply in 1952. In fact, she produced only 42.5 per cent of her domestic requirements. Production was concentrated in Nova Scotia and New Brunswick in the east, and in Saskatchewan, Alberta, British Columbia and the Yukon in the west. Of the 6,648,088 tons mined in the Maritimes

6,120,657 were from underground mines, and 527,431 tons from open pits, which are much easier to operate. Of the 10,930,914 tons mined in the West, 5,889,286 tons were from underground mines, and 5,041,628 tons from open pits. Central Canada produced no coal, and because of the long distances between it and the Canadian mines, it met its requirements from more readily accessible sources in the United States. The waste accounted for in the coal industry consisted of material dumped at the mines as being sub-standard. Most of this is a carbonaceous type of shale mixed with the coal hauled out of pits. Of the use accounted for, 19.7 per cent occurred within the energy-producing sector. Most of this was in coke and gas plants, mainly for the production of coke. Canada's iron and steel industry consumes large quantities of coke in its blast furnaces and to some extent in its steel furnaces. These furnaces together consumed the equivalent of about 7 tons of coal for every 10 tons of iron ore. About 1.3 million tons of coal were used by central electric stations.

Use of coal otherwise than for producing fuel or electricity was fairly evenly divided between three groups: household and commercial users which require coal mainly for space heating, manufacturers and mines which use it both for space heating and for power, and the transportation industry which uses it mainly for power.

Coal briquettes afford a convenient means of using the dust and small pieces which always occur when coal is mined. They do not form a major part of the energy picture. In 1952, they were used mainly by the railroads.

Crude petroleum - Crude petroleum was another major energy source for which Canada was heavily dependent on imports in 1952, when domestic production made up 44.0 per cent of the available supply. This was a considerable increase over the period before the Alberta oilfields were major producers. In 1939, for instance, Canadian sources supplied 17.0 per cent of domestic crude oil requirements; in 1948, the comparable figure was 13.7 per cent.

In 1952, the refineries of the Maritimes and of Quebec imported all their requirements of crude oil, because of their distance from the oilfields of the Canadian west. Ontario refineries met 59.5 per cent of their requirements from Canadian sources, from which a pipeline had been laid eastwards. The refineries of the Prairies and the Northwest Territories obtained almost all their crude oil from domestic wells. In British Columbia, 93.6 per cent of refinery requirements were imported by sea. Exports in 1952 were small, being about 1 per cent of available domestic supply. Almost all the crude petroleum used in Canada went into the refineries. A very small amount was used in pipeline operations.

Natural gas – Canada met her own requirements of natural gas in 1952, and had net exports of this commodity. The energy-producing sector itself used up 15.8 per cent of the natural gas produced. A slightly larger amount, 16.7 per cent, was wasted at the gas fields. Of the use outside the energy-producing sector, households were the major consumer, followed by manufacturing and mining establishments, and by commercial establishments. A certain amount of natural gas was used as a raw material, but the amount cannot be disclosed, because of the need to keep the activities of individual firms confidential.

Coke (except petroleum and pitch coke) – Canadian plants turned out 94.5 per cent of the Canadian supply of coke in 1952. Of this supply, 7.7 per cent was used by coke and gas plants. Blast furnaces consumed 2,493,903 tons, or well over half the available supply. When other uses as raw materials are taken into account, 2,790,415 tons, or 65.0 per cent of the available supply, were used as raw materials. Net use as energy, mainly by manufacturers and mines, accounted for less than a quarter of the available supply.

Gasoline and Naphtha – Naphtha was included with gasoline because they cannot be separated in certain trade statistics, but the data relate almost entirely to gasoline. Canadian refineries provided 89.8 per cent of the available supply of this important fuel. Owing to some discrepancy in the statistical system, use accounted for was greater than the apparent available supply. Almost all of this commodity was used outside the energy-producing sector. Most of it was for transportation, mainly for road transport.

Other petroleum fuels – A smaller proportion, 76.3 per cent, of the supply of other petroleum fuels was made up from domestic sources. Use within the energy-producing sector took up 7.6 per cent of available supply, petroleum refineries being the heaviest users here. Of the amount used as fuel outside the energy-producing sector, household and commercial users consumed most. Their use was primarily for space heating, and accounted for about two fifths of total consumption. The transportation sector, using petroleum fuels as a source of power, was responsible for almost a quarter of all use. Manufacturers and

mines, which used the oil partly for heating and partly for power, accounted for just over one fifth of the amount consumed.

Fuelwood – Fuelwood was supplied entirely from domestic sources. Data on its use are scanty, but it is known that about 6 per cent went as raw materials. It is probable that most of the remainder was used for domestic heating and cooking, although it is known that quantities of wood waste are burnt by manufacturers.

Electricity – Canada met her own requirements of electricity, and was a net exporter on a limited scale. Of the 66.1 billion kilowatt hours generated, at least 57.0 billion were generated by water power, and 2.4 billion by thermal plants. About 96.0 per cent of electricity was used outside the energy-producing sector, manufacturers using 60.6 per cent of the available supply. Most of this would be used for light and power, although substantial quantities of off-peak power were used for heating purposes by the pulp and paper industry, and large quantities were also used for industrial processes of which the use of electricity is an integral part, such as electroplating and certain stages of aluminum production. Household and commercial users accounted for about 19.2 per cent of the available supply. This use was probably mainly for lighting, cooking, and the operation of appliances. When electricity is transmitted over power lines, some of it is used up in overcoming resistance. Such line losses have been included in use for transportation, which absorbed about 10.2 per cent of the supply.

Other fuels – Petroleum coke was not a major source of energy. It was mainly used as a raw material, by manufacturing industry. The entire supply of manufactured gas was produced in Canada. Of this, 35.2 per cent was used by the coke and gas plants or the petroleum refineries which produced it. Manufacturers and mines were the other major users of manufactured gas, followed by households. Half the supply of liquefied petroleum gases was made up of Canadian production. Information about the disposal of this commodity is not complete, and 81.5 per cent of its use was unaccounted for. The energy-producing sector itself used 18.0 per cent of the output, petroleum refineries being responsible for nearly all of this.

CANADA'S CHANGING ENERGY PATTERN

PART 2 - The Pattern in 1952

This is the second of three articles on the supply and distribution of energy in Canada. The first one, *Part 1, The Supply and Distribution of Individual Commodities in 1952* appeared on pages I to V of the July, 1957 issue. The third one, which will appear in the October 1957 issue, will present historical series, which fit into the framework used for presenting the 1952 data.

ENERGY EQUIVALENTS

When measuring fuel in units of weight or volume, and electricity in kilowatt-hours, as was done in the first article, it is possible to discuss only one commodity at a time. To show the general energy pattern, and the relative part played by each commodity, it is necessary to use a common unit of measurement. The British thermal unit is used for the D.B.S. energy statistics project, and the consolidated table which appeared on pages II and III of the July 1957 issue has been fully converted to this basis elsewhere.¹ The conversion factors used were as follows.

	Unit	Millions of B.t.u. per unit
Coal, anthracite	ton	26
bituminous	ton	27
sub-bituminous	ton	19
lignite	ton	16
Coke, petroleum	ton	30.12
other	ton	25
Oil, crude.....	imperial gallon	0.17
Gasoline and naphtha	imperial gallon	0.15
Liquefied petroleum gases	imperial gallon	0.1146
Other petroleum fuels.....	imperial gallon	0.17
Natural gas	thousand cubic feet	1
Manufactured gas	thousand cubic feet	0.5
Fuelwood	cord	20
Electricity	thousand k.w.h.	3.412

The method used for converting electricity is worth a special mention here. A straight energy-equivalent approach was used, measuring the electricity in terms of the energy which it actually represents, irrespective of the method used for generating it. When interpreting any general comparisons in terms of B.t.u., it should be borne in mind that, in terms of work actually done, electricity is far more important than it is in terms of potential energy, because of its greater efficiency in use.

1. Reference Paper No. 69, *Energy Sources in Canada; Commodity Accounts for 1948 and 1952*. Pages 32 and 33.

The distinction between energy sources used and energy effectively applied is important, and merits a brief explanation. When a steam engine is in operation for instance, the energy source used consists of the coal which is stoked into the boiler. The energy effectively applied is the amount of force exerted by the driving shaft of the engine. The potential energy in the coal is not all effectively applied. Some heat, for instance goes up the chimney, some energy is used in overcoming friction within the engine, and some energy losses are inherent in the physical properties of steam.

In Canada, running water provides a very important supply of energy. The water-power which was used to generate electricity is covered by this memorandum (see Page I of the July issue). Water-power used directly, as for driving a machine by means of a turbine, is not covered because the relevant data are not available. However, this latter type of use is not quantitatively very important.

The available statistics on distribution cover the input of energy sources only. They range over such items as coal burned in factories, crude oil used in petroleum refineries, gasoline used in motor vehicles, and electricity used for street lighting. They do not measure energy effectively applied.¹

THE NET USE OF ENERGY

The B.t.u. conversion can be used to estimate the net use of energy in Canada. For each individual commodity group, the imputed consumption outside the energy-producing sector can be estimated by deducting from the apparent available supply the amount used within the energy-producing sector and waste; the balance includes measured use outside

1. An attempt to measure energy effectively applied has been made by the Department of Economic and Social Affairs, United Nations. They adjusted the energy equivalents of various fuels by their efficiency in use, for which rough estimates were obtained. Electricity was assumed to have an efficiency of 100 per cent in household and industrial use. The efficiency with which coal was used was assumed to vary from 4 per cent on railways, through 20 per cent in ships and 40 per cent in households to 55 per cent in industry. The efficiency of use of gasoline on highways was estimated at 20 per cent. Other efficiencies were estimated for different fuels in different uses. Obviously, the relative importance of the individual fuels, in a table for efficiency in use based on this method, will differ from the relative importance on a straightforward energy-equivalent basis. One striking difference is that the relative importance of electricity is much greater. No work has been done on these lines by D.B.S. on the Canadian data. A description of the method was, however, included in this article in order to emphasize what the figures given in terms of energy equivalent actually do and do not show.

**Imputed Consumption and Measured Portion of Distribution in Canada of Fuel and Electricity
Outside the Energy-producing Sector, 1952**

(billions of B.t.u.)

No.		Coal (excluding briquettes)	Coal briquettes	Crude petroleum	Natural gas	Coke (except petroleum and pitch coke)
1	Imputed consumption outside the energy-producing sector ¹	868,600	23,164	5,422	67,277	99,005
2	Unrecorded consumption and statistical discrepancy	17,300	1,398	3,713	-330	2,715
3	Measured portion of use outside the energy-producing sector	851,300	21,766	1,709	67,607	96,290
4	Use accounted for as raw materials	3,335	-	-	3	69,761
5	Measured portion of use as fuel or electricity outside the energy-producing sector- total	847,965	21,766	1,709	67,607	26,529
	Of which accounted for by:					
6	households and commercial	293,965	7,868	-	43,328	10,708
7	manufacturing and mining	271,584	4	-	22,677 ³	15,821
8	transportation	282,416	13,898	1,709	1,348	-
9	other and non-assignable	-	-	-	254	-
	(as a percentage of total)					
10	Imputed consumption outside the energy-producing sector	38.4	1.0	0.2	3.0	4.4
11	Unrecorded consumption and statistical discrepancy	9.7	0.8	2.1	-0.2	1.5
12	Measured portion of use outside the energy-producing sector	40.8	1.0	0.1	3.2	4.6
13	Use accounted for as raw materials	3.6	-	-	-	74.5
14	Measured portion of use as fuel or electricity outside the energy-producing sector- total	42.5	1.1	0.1	3.4	1.3
	Of which accounted for by:					
15	households and commercial	47.7	1.3	-	7.0	1.7
16	manufacturing and mining	47.2	-	-	3.9	2.8
17	transportation	36.9	1.8	0.2	0.2	-
18	other and non-assignable	-	-	-	0.7	-

1. Apparent available supply minus measured waste minus measured use in energy-producing sector.

2. There is some double-counting in this row, because some of the electricity used by industry was generated by the consumers, using fuel for this purpose.

3. Use as raw material is included with consumption as fuel.

*Imputed Consumption and Measured Portion of Distribution in Canada of Fuel and Electricity
Outside the Energy-producing Sector, 1952*

(billions of B.t.u.)

Petroleum coke	Manufactured gas	Liquefied petroleum gases	Gasoline and naphtha	Other petroleum fuels	Fuelwood and wood waste useable as fuel	Electricity	Canada total	No.
12,031	31,859	9,225	339,491	472,029	121,785	214,977	2,264,865	1
899	1,284	9,165	-7,537	28,057	114,477	6,516	177,657	2
11,132	30,575	60	347,028	443,972	7,308	208,461 ²	2,087,208 ²	3
11,030	-	-	1,811	344	7,289	-	93,570	4
102	30,575	60	345,217	443,628	19	208,461 ²	1,993,638 ²	5
102	11,264	-	-	207,440	6	41,730	616,405	6
-	19,041	-	-	105,758	6	140,517 ⁴	575,398 ⁴	7
-	22	60	318,360	126,085	19	22,065	765,982	8
-	248	-	26,857	4,345	-	4,149	35,853	9

(as a percentage of total)

0.5	1.4	0.4	15.0	20.8	5.4	9.5	100.0	10
0.5	0.7	5.2	-4.2	15.8	64.4	3.7	100.0	11
0.5	1.5	1	16.6	21.3	0.4	10.0	100.0	12
11.8	-	-	1.9	0.4	7.8	-	100.0	13
1	1.5	1	17.3	22.3	1	10.5	100.0	14
1	1.8	-	-	33.7	6	6.8	100.0	15
-	3.3	-	-	18.4	6	24.4	100.0	16
-	1	1	41.6	16.4	1	2.9	100.0	17
-	0.7	-	74.9	12.1	-	11.6	100.0	18

4. Some industrial use may have been recorded as bituminous coal.

5. Less than .05 per cent.

6. The unrecorded consumption of fuelwood probably occurred mainly in household and commercial uses with most of the balance used by manufactures.

the energy-producing sector, use unaccounted for, and some statistical discrepancy. For example, the apparent supply of natural gas in 1952 was 99,664,526 thousand cubic feet, of which 15,708,444 thousand were known to have been used for producing fuel or electricity, and 16,679,023 thousand were wasted. The imputed net consumption was therefore 67,277,059 thousand cubic feet. The equivalent energy value was 67,277 billion B.t.u. The imputed consumption of all groups shown in the consolidated table in the July issue was as follows:

	Billions of B.t.u.	Per cent of total
Coal (excluding briquettes).....	868,600	38.4
Coal briquettes	23,164	1.0
Crude petroleum	5,422	0.2
Natural gas	67,277	3.0
Manufactured gas	31,859	1.4
Coke (except petroleum and pitch coke)	99,005	4.4
Petroleum coke	12,031	0.5
Liquefied petroleum gases	9,225	0.4
Gasoline and naphtha	339,491	15.0
Other petroleum fuels	472,029	20.8
Fuelwood and wood waste use-able as fuel	121,785	5.4
Electricity	214,977	9.5
Canada total	2,264,865	100.0

Coal stands out as the major commodity, so far as end-use is concerned, with the fuel oils second and gasoline third. Coal and its products accounted for 43.8 per cent of end use, while petroleum and its products accounted for 36.7 per cent. The total imputed consumption of energy was 157.0 million B.t.u. per head of population.

THE END USES OF FUEL COMMODITIES

When the main table is converted into B.t.u., some lines can be added without double-counting, but others cannot. Net imports, which can be summed for all commodities, amounted to 1,310,097 B.t.u. in 1952. Production, however, cannot be added for all items. Some of the coal produced, for instance, is used for making electricity, and some of the electricity produced is used in mining coal. Use outside the energy-producing sector can, however, be added, since these are all end-uses.

The table below shows in terms of B.t.u. the use of fuel commodities and electricity outside the energy-producing sector in absolute and in percentage terms. The total for imputed consumption is from the table above, and is broken down between meas-

ured use outside the energy-producing sector, and a statistical discrepancy which is mainly due to use unaccounted for, but is also affected by possible inaccuracies of measurement of the available supply. Use outside the energy-producing sector, and the breakdown of it, are from Table 6 of Reference Paper No. 69.

	Billions of B.t.u.	Per cent of imputed consumption outside the energy-producing sector
Imputed consumption outside the energy-producing sector	2,264,865	100.0
Unrecorded consumption and statistical discrepancy	177,657	7.8
Measured portion of use outside the energy-producing sector	2,087,208	92.2
Use accounted for as raw materials	93,570	4.1
Measured portion of use as fuel and electricity outside the energy-producing sector-total ..	1,993,638	88.1
Of which accounted for by:		
households and commercial	616,405	27.2
manufacturing and mining	575,398	25.4
transportation	765,982	33.9
other	4,032	0.2
non-assignable	31,821	1.4

It will be noted that unrecorded consumption and statistical discrepancy made up 7.8 per cent of the imputed net consumption, mainly because of lack of information about the disposition of fuelwood. For fuels as a whole, use as raw materials accounted for only 4.1 per cent of the net consumption. It should be remembered that the large quantities used for conversion into other types of fuel are excluded from this table. Crude petroleum, for instance, is only a minor item so far as use outside the energy-producing sector is concerned. Transportation was the biggest end-use consumer, accounting for 33.9 per cent of imputed net consumption. The household and commercial sector, with 27.2 per cent was just ahead of manufacturing and mining, with 25.4 per cent.

Similar data on the use of each individual fuel commodity are shown in the table on Pages ii and iii.

The extent to which fuelwood contributes to the total of unrecorded consumption and the statistical discrepancy is brought out in this table. Since most of the fuelwood unaccounted for probably went in household and commercial use, the proportion of use of all fuel commodities accounted for by households and commercial consumers should be interpreted with

care. A percentage distribution of actual use would show fuelwood as providing probably over 15 per cent of the total, with other fuels proportionately reduced. A percentage distribution of actual total use outside the energy-producing sector would probably show fuelwood as contributing about 5 per cent.

It is clear that the household and commercial sector was more dependent on coal than on petroleum products, as was the manufacturing and mining sector. Transportation, however, met 58 per cent of its measured requirements of energy by petroleum fuels. Manufacturers and mines were more dependent on electricity than other sectors, satisfying nearly a quarter of their energy requirements in this form.

NET ACCESSION OF ENERGY TO CANADA

Although the items of production cannot be added together, nor can the items of apparent available supply, there is one concept of availability of energy by which a total for Canada can be arrived at. If all energy sources are measured at the first stage at which they enter the Canadian economy, then they can be added to give the gross accession. This would consist of production from the natural environment, that is minerals produced at the mine or well and electricity generated by water power, plus imports of all relevant items in the form in which they enter the country. Deduction of exports leaves the net accession of fuel and electricity to Canada. It is shown for 1952 in the tables below. (The data for electricity include some generated in thermal plants by manufacturers and mines for their own use, which could not be eliminated for technical reasons). A figure for net imports is given instead of showing

imports and exports separately. The first table gives the B.t.u. components, and the second expresses the items as percentages of the total.

When using this particular type of approach, some statistical authorities use an alternative method of conversion, under which hydro-electricity is converted to a common unit on the basis of the energy potential of the coal or other fuel that would be required to produce it, at current levels of operating efficiency. This gives a bigger value to electricity and consequently makes it a higher proportion of net accession.

The net accession is, of course, greater in total than the imputed net consumption. It represents the total input of energy sources to the country, whereas the imputed net consumption excludes use within the energy-producing sector and waste. For some individual commodities, however, net consumption is greater than net accession, because some are largely, or almost wholly, converted into others before they come to their end use.

Coal was the major item of basic supply and with its products provided 43.4 per cent. Crude petroleum, gasoline, petroleum coke and other petroleum fuels provided 40.0 per cent. Electricity provided 8.1 per cent, fuelwood 4.8 per cent, and natural gas and liquefied petroleum gases 4.2 per cent.

Net imports provided 50.9 per cent of net accession in 1952. Of this, 43.9 per cent of the total consisted of imports of raw materials, and 7.3 per cent consisted of imports of other fuels. Net exports of electricity, 0.3 per cent of the total, were deducted to give total net imports of 50.9 per cent.

Net Accession of Fuel and Electricity to Canada, 1952

(billions of B.t.u.)

	Production from natural environment	Net imports	Total net accession
Coal	451,715	645,505	1,097,220
Coal briquettes	-	4,194	4,194
Coke (other than petroleum coke or pitch coke)	-	5,883	5,883
Crude petroleum	367,812	487,889	855,701
Petroleum coke	-	6,916	6,916
Gasoline and naphtha	-	30,154	30,154
Other petroleum fuels	-	134,802	134,802
Natural gas	105,364	-2,164	103,200
Liquefied petroleum gases	-	5,654	5,654
Fuelwood and wood waste useable as fuel	122,082	-297	121,785
Electricity	217,374 ¹	-8,439	208,935 ¹
Total	1,264,347	1,310,097	2,574,444

1. This figure includes a small amount of electricity generated in thermal plants by manufacturers and mines for their own use.

Net Accession of Fuel and Electricity to Canada
Percentage Distribution by Commodities, 1952
(per cent)

	Production from natural environment	Net imports	Total net accession
Coal	17.6	25.0	42.6
Coal briquettes	-	0.2	0.2
Coke (other than petroleum or pitch coke)	-	0.2	0.2
Crude petroleum	14.3	19.0	33.3
Petroleum coke	-	0.3	0.3
Gosoline and naphtha	-	1.2	1.2
Other petroleum fuels	-	5.2	5.2
Natural gas	4.1	-0.1	4.0
Liquefied petroleum gases	-	0.2	0.2
Fuelwood and wood waste useable as fuel	4.7	2	4.7
Electricity	8.4 ¹	-0.3	8.1 ¹
TOTAL	49.1	50.9	100.0

1. This figure includes a small amount of electricity generated in thermal plants by manufacturers and mines for their own use.

2. Less than .05 per cent.

CANADA'S CHANGING ENERGY PATTERN

PART 3 - Changes from 1926 to 1956

This is the third of three articles on the supply and distribution of energy in Canada. *Part 1, The Supply and Distribution of Individual Commodities in 1952* appeared on pages i to v of the July, 1957 issue. *Part 2, The Pattern in 1952* appeared on pages i to vi of the August, 1957 issue. The current article presents historical data for selected years from 1926 to 1956, all of which relate to concepts covered by the two earlier articles. The data from 1926 to 1952 have either been published in reference papers, or are based on data published in them.¹

The last thirty years have seen great changes in the Canadian energy pattern. The quantities of the individual fuels and of electricity produced and consumed have changed considerably, and their relative importance in the total energy picture has undergone a great change, which has been specially rapid in recent years.

The table below gives indexes of the production and the apparent available supply of the main group

1. Reference Paper No. 69, *Energy Sources in Canada; Commodity Accounts for 1948 and 1952* and Reference Paper No. 74, *Energy Sources in Canada; Commodity Statements for 1926, 1929, 1933 and 1939*.

of fuels and of electricity, for selected years from 1926 to 1956. The definitions of production are the same as those used in the reference papers.

The production of coal, which was for a considerable time Canada's major source of energy, has decreased in recent years, and the apparent available supply has decreased even more. Fuelwood is the only other energy source of which the production and supply has decreased. For short-period comparisons the fuelwood indexes may not be completely reliable, because for intercensal years the production figures rely heavily on estimates based on population.

The increase in the production of crude petroleum has been remarkable, from an index (1948 = 100.0) of 3.0 in 1926 to one of 1,388.2 in 1956. Production of natural gas has also increased considerably, as has that of manufactured fuels. The increased production of natural gas included an increasing proportion of waste. In 1952, waste made up less than one-sixth of total production, but by 1956 it made up over one-third. One reason for this was that much of the natural gas was produced in conjunction with crude petroleum, the market for which had expanded considerably. Production of electricity has shown a

Index of the Production and Apparent Available Supply of Fuels and Electricity in Canada,
Selected Years, 1926 to 1956

(1948 = 100)

	1926	1929	1933	1939	1948	1952	1953	1954	1955 (Prelim.)	1956 (Prelim.)
Production										
Coal	89.3	94.8	64.5	85.1	100.0	95.3	86.2	80.8	80.3	80.8
Coal briquettes	n.a.	n.a.	n.a.	n.a.	100.0	199.6	198.9	233.3	183.5	211.3
Crude petroleum	3.0	9.1	9.3	63.7	100.0	503.1	663.3	787.5	1,060.5	1,388.2
Natural gas ¹	20.7	30.5	24.9	37.8	100.0	113.3	135.1	161.8	205.6	251.1
Coke ²	51.4	67.9	44.9	61.1	100.0	102.8	107.8	86.8	102.1	109.5
Petroleum coke	58.9	125.2	85.5	75.9	100.0	232.6	273.0	270.9	428.1	516.3
Manufactured gas	38.8	48.7	37.8	57.3	100.0	113.8	119.7	105.0	112.5	n.a.
Liquefied petroleum gases	n.a.	n.a.	n.a.	n.a.	100.0	344.2	423.4	661.8	941.3	n.a.
Gasoline and naphtha	18.0	35.6	36.6	60.1	100.0	166.3	183.1	196.1	218.1	236.0
Other petroleum fuels	21.0	36.5	37.6	47.2	100.0	168.2	190.0	215.1	249.5	318.5
Fuelwood ³	132.7	140.6	124.5	146.2	100.0	84.3	81.0	76.5	73.7	71.3
Electricity	25.7	41.3	39.6	65.5	100.0	139.9	148.1	153.2	168.0	186.6
Apparent Available Supply										
Coal	69.4	75.5	49.4	65.6	100.0	89.7	85.0	75.6	76.3	77.7
Coal briquettes	n.a.	n.a.	n.a.	n.a.	100.0	132.9	131.1	148.4	122.0	135.3
Crude petroleum	18.0	34.4	32.3	51.6	100.0	157.2	179.7	192.9	225.0	262.3
Natural gas ¹	21.4	31.5	25.6	38.7	100.0	110.2	130.7	160.8	206.3	256.9
Coke ²	64.5	85.0	54.4	66.3	100.0	99.1	101.4	82.1	102.9	107.5
Petroleum coke	58.9	125.2	85.5	75.9	100.0	232.6	273.0	270.9	428.1	516.3
Manufactured gas	38.8	48.7	37.8	57.3	100.0	113.8	119.7	105.0	112.5	n.a.
Liquefied petroleum gases	n.a.	n.a.	n.a.	n.a.	100.0	344.2	423.4	661.8	941.3	n.a.
Gasoline and naphtha	20.3	41.3	31.6	52.6	100.0	155.2	166.8	174.1	192.2	203.0
Other petroleum fuels	23.3	35.9	33.2	41.5	100.0	180.9	199.9	224.7	256.7	311.6
Fuelwood ³	133.0	140.7	124.4	145.8	100.0	84.4	81.1	76.5	73.8	71.2
Electricity	23.3	39.6	41.0	63.7	100.0	139.5	148.5	153.1	164.7	182.7

1. Includes waste gas.

2. Other than petroleum and pitch coke.

3. Includes wood waste usable as fuel.

steady increase. Production of hydro-electricity has increased less rapidly than that of electricity as a whole during recent years, because an increasing proportion of the new generating capacity installed has consisted of thermal plants.

In general, the increases in the supply of fuel have been considerable, but they have been less spectacular than those in production, because one feature of the period has been an increase in the proportion of the supply met from Canadian sources. The major increases in supply have taken place in the case of petroleum and natural gas and their products, and electricity.

Imputed Net Consumption of Energy

Data on the production and apparent available supply of different fuels cannot be added together. If the relative importance of different types of fuel and of electricity are to be compared, other concepts must be used, for which the figures can be added.

It was shown in the second article in this series how data for the imputed consumption of fuel and electricity outside the energy-producing sector can be worked out, by deducting from the apparent available supply waste and use within the energy-pro-

ducing sector. The imputed net consumption of different fuels and of electricity can be added together after they have been converted into British thermal units. The table below gives the imputed net consumption of energy in Canada for selected years from 1926 to 1956, and also shows the imputed consumption per head of population.

The rate of increase in consumption has been much slower than the rates of increase for the supply of most of the individual fuel commodities. The total was approximately steady during 1952, 1953 and 1954, and resumed its rise in 1955 and 1956. However, the composition of the total underwent drastic changes over the period during which consumption was steady, with a general trend towards items of which a higher percentage of the potential energy was likely to be effectively applied. Coupled with this has been a long-run trend towards the more efficient use of fuels in general.

Because population was increasing over the period, energy consumption per head naturally rose more slowly than total consumption. In fact, consumption per head from 1952 to 1954 was lower than it had been in 1948. The increase from 1954 to 1956 was, however, marked.

Use of Fuels and Electricity per Head of Population, Selected Years, 1926 to 1956

	Population at 1 June (Thousands of persons)	Imputed consumption outside the energy-producing sector ¹			
		Total		Per head	
		Billions of B.t.u.	Index (1948=100)	Millions of B.t.u.	Index (1948=100)
1926	9,451	1,115,831	55.3	118.1	75.0
1929	10,029	1,315,223	65.1	131.1	83.3
1933	10,633	946,438	46.9	89.0	56.5
1939	11,267	1,290,544	63.9	114.5	72.7
1948	12,823	2,018,737	100.0	157.4	100.0
1952	14,459	2,264,865	112.2	156.6	99.5
1953	14,845	2,290,576	113.5	154.3	98.0
1954	15,287	2,270,011	112.4	148.5	94.3
1955 (Prelim.)	15,698	2,502,978	124.0	159.4	101.3
1956 (Prelim.)	16,081	2,704,886	134.0	168.2	106.9

1. Apparent available supply minus measured use in energy-producing sector minus measured waste.

The distribution of the imputed consumption among the different fuels and electricity is given in the table below. The figures refer to the net use of energy as such at the last stage for which measurement is practicable, and thus show the relative contribution of each commodity to the end-use of energy. What is measured, is, of course, the potential energy in the commodity concerned, not the amount of energy effectively applied. For this reason, care is needed when interpreting the figures for electricity, because this commodity is applied much more effectively than the fuels when used instead of them for conversion into mechanical effort. Its relative effective contribution is therefore more important than its relative potential.

Since this table is on a commodity basis, the data for electricity take no account of the means whereby it was produced. The consumption figures for individual fuels exclude any quantities which may have been used in generating electricity.

Perhaps the most striking feature of the table is the decrease in the proportion of coal from 61.8 per cent in 1926 to 25.4 per cent in 1956. In the last eight years the proportion has halved. Gasoline and other petroleum fuels between them rose from 9.2 per cent of net consumption in 1926 to 47.3 per cent in 1956. The decreasing importance of fuelwood was marked, as was the increasing importance of elec-

tricity. The contribution of natural gas has been increasing in recent years, but it was still a small part of the total net consumption in 1956.

The part played by fuel oil as compared with gasoline has increased. In 1926, gasoline and naphtha provided 4.1 per cent of consumption as against 5.1 per cent by other petroleum fuels, but by 1956 the comparative figures were 16.7 per cent and 30.6 per cent. One reason for the more rapid growth of other petroleum fuels has been that they have been

replacing coal in several uses, particularly on the railroads and in domestic heating. The relative importance of gasoline has increased with the growth of road and air transport, but it has not been directly substituted for other fuels on as large a scale as fuel oil.

The 1956 data for three of the fuels have been consolidated, because the individual data were considered less reliable than those for the other commodities.

Percentage Distribution of the Imputed Consumption of Individual Fuels, and of Electricity, Outside the Energy-producing Sector, for Selected Years, 1926 to 1956.

(Per Cent of B.t.u. Contribution to Canada Total)

	1926	1929	1933	1939	1948	1952	1953	1954	1955 (Prelim)	1956 (Prelim)
Coal	61.8	56.3	49.7	50.1	51.2	38.4	33.9	30.7	27.6	25.4
Coal briquettes	3	3	3	3	0.9	1.0	1.0	1.1	0.8	0.9
Crude petroleum	-0.4 ⁴	0.1	-0.6 ⁴	9.1	0.3	0.2	1.4	0.2	2.2	-
Natural gas	5	1.7	2.2	2.1	2.2	3.0	3.2	4.1	4.7	4.9
Coke ¹	6.4	7.0	5.9	5.1	4.8	4.4	4.4	3.5	4.0	3.9
Petroleum coke										
Manufactured gas	5	1.2	1.2	1.0	1.4	1.4	1.5	1.3	1.2	2.8
Liquefied petroleum gases ..	3	3	3	3	0.3	0.4	0.4	0.6	0.6	
Gasoline and naphtha	4.1	7.0	7.4	9.1	11.1	15.0	15.9	16.8	16.5	16.7
Other petroleum fuels	5.1	6.6	8.6	8.1	12.5	20.8	22.7	25.9	27.6	30.6
Fuelwood ²	17.2	15.5	18.9	16.3	7.2	5.4	5.1	4.9	4.2	3.8
Electricity	3.2	4.6	6.7	7.6	7.6	9.5	10.0	10.4	10.1	11.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1. Excludes petroleum and pitch coke.
2. Includes wood waste usable as fuel.
3. Not known.
4. This negative value is a statistical discrepancy.
5. Natural and manufactured gas combined, 2.6 per cent in 1926.

Net Accession of Energy

When measuring the imputed consumption of energy, account is taken of fuels and electricity used at the final point of consumption, in the form in which they are used there. An alternative approach to the pattern of energy is to look at the sources from which it is derived. This can be done by using the net accrual of energy to Canada, which consists of domestic production from original sources, plus imports of fuel and electricity in the form in which they enter the country minus exports. From this net accession, all the energy requirements of Canada are met.

The electricity figure used for this concept should theoretically include hydro-electricity only, so far as production is concerned. It was not possible to break out all the electricity generated by

thermal plants from the figures for earlier years, but the error caused by including it is small.

The net accession is, of course, larger than the imputed consumption for energy as a whole, since it includes all the fuel subsequently used in producing other forms of fuel or electricity. It is less than the imputed consumption in the case of a number of processed fuels, such as fuel oil, since a good proportion of these is made in Canada from raw materials which themselves appear in the net accession data as production or imports.

The table below gives the net accession of energy to the Canadian economy broken down between domestic production and net imports, together with index numbers. Total accession increased by more than a third in the past eight years, production from Canadian natural resources increasing rapidly while net imports declined.

Net Accession of Energy to the Canadian Economy, Selected Years, 1926 to 1956

	Production from natural environment ¹	Net Imports	Total	Production from natural environment	Net Imports	Total
	(billions of B.t.u.)			(Index, 1948 = 100)		
1926	655,583	595,456	1,251,039	69.1	42.8	53.5
1929	726,820	718,888	1,445,708	76.7	51.7	61.8
1933	552,713	491,874	1,044,587	58.3	35.4	44.7
1939	779,444	615,228	1,394,672	82.2	44.3	59.7
1948	948,199	1,389,649	2,337,848	100.0	100.0	100.0
1952	1,264,347	1,310,097	2,574,444	133.3	94.3	110.1
1953	1,341,082	1,252,643	2,593,725	141.4	90.1	110.9
1954	1,432,113	1,130,905	2,563,018	151.0	81.4	109.6
1955	1,681,482	1,125,429	2,806,911	177.3	81.0	120.1
1956	1,989,321	1,170,396	3,159,717	209.8	84.2	135.2

¹ Includes electricity generated in thermal plants by manufacturers and mines for own use through 1954, and excludes hydro-electricity generated by electric railways for own use throughout.

The data for Canadian production can be further subdivided according to the nature of the natural resources used. Mines are an extractive resource, which can be used once and once only. Forests are a source of energy which can be used continuously, provided that the forests are renewed as they are cut down. Water power is a continuous supply of energy, except for changes in climate and topography. The table below gives a breakdown by these sources. Canada has reduced her requirements of

energy from the rest of the world by a considerable extent since 1948. This change has been accompanied by a greater reliance on domestic extractive resources, the percentage contribution of which has almost doubled over eight years. This has been mainly due to the growth of the crude petroleum industry. The relative contribution of continuous resources is greater than it was in the pre-war years, but the relative contribution of the renewable resources is considerably less.

**Net Accession of Energy to the Canadian Economy, Selected Years, 1926 to 1956:-
Percentage Contributions of Different Sources**

(Per Cent of Total Net Accession)

	Production in Canada from natural environment			Net Imports	Total Net Accession
	Extractive resources (mines)	Renewable resources (forests)	Continuous resources (water power)		
1926	33.8	15.4	3.2	47.6	100.0
1929	31.8	14.0	4.4	49.8	100.0
1933	29.6	17.3	6.0	47.1	100.0
1939	33.2	15.2	7.5	44.1	100.0
1948	27.6	6.2	6.7	59.5	100.0
1952	36.0	4.7	8.4	50.9	100.0
1953	38.5	4.5	8.7	48.3	100.0
1954	42.4	4.3	9.2	44.1	100.0
1955	47.1	3.8	9.0	40.1	100.0
1956 (Prelim.)	50.9	3.3	8.8	37.0	100.0

Breaking down the net accession between production and net imports shows the relationship between Canada and the rest of the world, so far as the overall energy situation is concerned. It shows the extent to which Canada uses more of the world's energy sources than it produces itself. When the economy is examined in detail, however, it is apparent that individual areas of the country can be much more heavily dependent on imports than the country as a whole. Central Canada, for instance, relies heavily on the United States for its coal, although there are large-scale coal mining operations in the Maritimes, the Prairies and B.C. Quebec and the Maritimes import crude petroleum by sea from other countries, at the same time as Western Canada exports it.

The net accession can be broken down in such a way as to show how much of the energy actually used in Canada originated here, and how much was imported. This can be done by deducting exports from production, to give production retained in Canada, and adding total imports to this. In the case of a commodity which is exported, this will give different results from the previous breakdown. The table below breaks down the net accession in 1956 by both approaches. It is seen that Canada's situation with respect to the world as a whole is that she produces an amount equivalent to 63 per cent of her requirements. However, only 53.5 per cent of the total accession of energy consists of production retained for use at home.

Percentage Contributions of Canadian and Foreign Energy Sources to the Net Accession of Energy in Canada, 1956 (Prelim.)

Commodity	Percentage contribution to net accession					
	Production	Net imports	All sources	Retained production	Total imports	All sources
Coal	11.4	19.1	30.5	10.9	19.6	30.5
Crude petroleum	32.1	12.0	44.1	24.0	20.1	44.1
Natural gas	7.4	0.1	7.5	7.0	0.5	7.5
Fuelwood and wood waste usable as fuel	3.3	1	3.3	3.3	1	3.3
Hydro-electricity ²	8.8	-0.5	8.3	8.3	1	8.3
Net imports of fuels manufactured from coal ³	-	0.4	0.4	-	0.4	0.4
Net imports of fuels manufactured from petroleum	-	5.9	5.9	-	5.9	5.9
All sources	63.0	37.0	100.0	53.5	46.5	100.0

1. Less than .05 per cent.

2. Includes electricity generated in thermal plants by manufacturers and mines for own use through 1954 and excludes hydro-electricity generated by electric railways for own use throughout.

3. Includes coal briquettes.

Crude petroleum is the commodity for which the alternative breakdowns give figures with the greatest difference. This is because of the heavy exports. If exports rose to the same level as imports, Canada would not be drawing on the rest of the world for oil, taking the global approach. In detail, however, a considerable area of Canada would be dependent on foreign countries for its oil supplies. What happened in practice in 1956 was that, although Canada produced oil to the equivalent of 32.1 per cent of the net accession of energy, the amount actually kept for use in Canada was equivalent to only 24.0 per cent of the net accession.

For most of the commodities, the difference between the two approaches is small, because exports are small. Up to quite recent years, the two approaches would show small differences for all commodities. Petroleum exports were heavy in 1955 as well as in 1956.

The commodities of which this net accession is composed have changed considerably over the past thirty years. The table below gives the percentage distribution by individual sources of supply. The part played by coal and its products decreased from 70.4 per cent of the net accession in 1926 to 30.9 per cent in 1956. The part played by oil and its products in the energy base increased considerably, from 9.9 per cent of the net accession in 1926 to 50 per cent in 1956. Hydro-electricity increased in relative importance up to 1954, then declined relatively to fuels. The relative contribution of fuelwood dropped from 15.4 per cent of net accession in 1926 to 3.3 per cent in 1956, while natural gas increased from 1.5 per cent in 1926 to 7.5 per cent in 1956. In the case of manufactured products, the figures for net accession are for imports only. Canadian manufactured fuels would be made from materials accounted for under raw material production or imports.

Net Accession of Energy to the Canadian Economy - Individual Fuels and Electricity as a Per Cent of Total

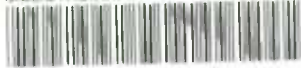
	1926	1929	1933	1939	1948	1952	1953	1954	1955	1956 (Prelim.)
Coal	68.5	62.2	55.4	53.2	54.5	42.6	38.0	33.1	30.7	30.5
Crude petroleum	7.6	12.7	16.4	19.6	23.2	33.3	37.0	40.4	42.9	44.1
Natural gas	1.5	2.0	2.2	2.5	4.0	4.0	4.7	5.9	6.8	7.5
Fuelwood and wood waste usable as fuel	15.4	14.0	17.2	15.1	6.2	4.7	4.5	4.3	3.8	3.3
Hydro-electricity ¹	2.8	4.1	6.0	7.1	6.5	8.1	8.4	8.9	8.5	8.3
Net imports of fuels manufactured from coal ²	1.9	2.0	1.4	0.8	0.8	0.4	0.3	0.2	0.3	0.4
Net imports of fuels manufactured from petroleum	2.3	3.0	1.4	1.7	4.8	6.9	7.1	7.2	7.0	5.9
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1. Includes electricity generated in thermal plants by manufacturers and mines for own use through 1954, and excludes hydro-electricity generated by electric railways for their own use throughout.

2. Includes coal briquettes.

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