

WEC
World Energy Consumption
A Database
1820-2020

(2022 revision)

Paolo Malanima

(Guangxi Normal University)

malanima@unicz.it
pmalanimap@gmail.com

Quotation: Malanima, WEC World Energy Consumption. A Database 1820-2020
[https://histecon.fas.harvard.edu/energyhistory/DATABASE%20World%20Energy%20Consumption\(MALANIMA\).pdf](https://histecon.fas.harvard.edu/energyhistory/DATABASE%20World%20Energy%20Consumption(MALANIMA).pdf)

The present statistical reconstruction would have been impossible without my cooperation, in the last twenty to twentyfive years, with the following scholars: E. Anthony Wrigley, Astrid Kander, Paul Warde, Ben Gales, Mar Del Mar Rubio, Silvana Bartoletto, Sofia Teives Henriques, Richard W. Unger, John Thistle. In particular, for the present *Database* I could also exploit the generosity of César Yáñez, Peter A. O 'Connor, David Streets, who provided me with materials on specific topics. My thanks to everyone. The errors are, of course, only mine.

In the present revision of the Database (1820-2020), the series have been updated with the inclusion of the years 2019 and 2020. Some errors have been corrected. The main change is, however, the inclusion of Greenhouse Gas (GHG) Emissions.

WEC Database has been exploited in my following articles:

Malanima P. *The Limiting Factor: Energy, Growth, and Divergence, 1820–1913*, in “Economic History Review”, 73 (2020), pp. 486–512.

Malanima P. *Energy, Productivity and Structural Growth. The Last Two Centuries*, in “Structural Change and Economic Dynamics”, 58 (2021), pp. 54–65.

to the memory of

E. Anthony Wrigley

CONTENTS

Statistical sources and methods

1. Geographic coverage
2. Total and per capita energy consumption per macro-area and per source
3. Traditional sources
4. Modern sources
5. Comparisons (consumption)
6. GHG emissions
7. Comparisons (GHG)

References

1. Databases
2. Literature

Tables

- Table 1. The macroareas
- Table 2. Countries per macroarea
- Table 3. Percentage of population in our sample of 72 countries on World population (in Table B.1) and on total population per macroarea in 1820, 1900, 2020
- Table 4. Daily food intake per capita by FAO in 1964-2030 (kcal)
- Table 5. Daily food intake per decade (in kcal per capita) 1820-2020
- Table 6. Ratio between the series by FAO and those by Fernandes et al. (2007) 1961-2000
- Table 7. Data of fuelwood consumption in kg per capita per day by FAO 2000-15
- Table 8. Kcal per capita per day from fuelwood 1820-2020
- Table 9. World working animals per species in about 2000 (000,000)
- Table 10. Estimates by Kander-Warde of working animals in Sweden, The Netherlands, England, Germany, France, Spain and Italy, Heq and Kcal of fodder per inhabitant in 1815-1913
- Table 11. Heq estimate including only horses for a sample of countries in EE 1938-55
- Table 12. Kcal per capita per day from fodder consumed by working animals 1820-2020
- Table 13. Different estimates in Kcal per capita per day of traditional sources of energy on the World scale 1820-2000
- Table 14. Ratio production to consumption per macroarea for Coal, Oil, Gas and Hydroelectricity 1925, 1950, 1965
- Table 15. Correlation between the present series of modern sources for Latin America and those by Mar Del Mar Rubio 1856-2000
- Table 16. Comparison of two series relating to energy consumption in Africa in 2010-18 (Mtoe)
- Table 17. Comparisons of two reconstructions of World energy consumption in 1820-2000 (decadal series in Mtoe)
- Table 18. CO₂ emissions from fossil sources in kg per Gigajoule, in tons per MTOE and the oxidised share
- Table 19. CO₂ emissions per source on total emissions from fossil sources 1820-2020 (%)
- Table 20. Databases of GHG, years covered by any series and correlation of any series with WEC series.

Figures

- Figure 1. Horse equivalents per capita (ratio horse equivalents-population) in a sample of countries 1980-90
- Figure 2. Comparisons of five series of energy consumption relative to Oceania 1960-2020 (Mtoe)
- Figure 3. Two series of World energy consumption of modern sources 1820-1985 (Mtoe, 5-years)
- Figure 4. Comparison of two decadal series of World energy consumption 1820-2008 (Mtoe)
- Figure 5. Comparison of two series of World energy consumption –total and per capita consumption- (Mtoe Total and koe Per capita)- 1800-2020
- Figure 6. Five series of World energy consumption 1960-2020 (Mtoe)
- Figure 7. Two series of per capita World energy consumption 1970-2020 (Koe per capita)
- Figure 8. Two series of energy consumption in 1991 (biomass included; Koe per capita)
- Figure 9. World CO₂ emissions milion tons (Mtons) per source (coal, oil,gas) and per capita emissions (Tons) 1820-2020
- Figure 10. Global GHG emissions (CO₂eq) in millions of tons (Mtons) per source (fossil and non fossil) and emissions per capita (in tons) 1820-2020
- Figure 11. World emissions in millions of tons (Mton) of CO₂eq per source (fossils plus non fossil gases plus LULUCF) 1850-2015
- Figure 12. Four series of global emissions in millions of tons (Mtons) 1750-2020

Maps

- Map 1. World per capita energy consumption in 1820 (Kcal/day)
- Map 2. World per capita energy consumption in 2000 (Kcal/day)

The WEC database

Tables

Population

- Table P.1 Population per macroarea and the World total 1820-2020 (000)
- Table P.2 Population per country and total population of 72 countries 1820-2020 (000)

Energy consumption

- Table A.1 World energy consumption per macroarea 1820-2020 (Mtoe)
- Table A.2 Percentage of World energy consumption per macro-area per decade 1820-2020
- Table A.3 World energy consumption per source 1820-2020 (Mtoe)
- Table A.4 Percentage of any source on World energy consumption per decade 1820-2020
- Table A.5 Total energy consumption per source in Western Europe 1820-2020 (Mtoe)
- Table A.6 Total energy consumption per source in Eastern Europe 1820-2020 (Mtoe)
- Table A.7 Total energy consumption per source in North America 1820-2020 (Mtoe)
- Table A.8 Total energy consumption per source in Latin America 1820-2020 (Mtoe)
- Table A.9 Total energy consumption per source in Oceania 1820-2020 (Mtoe)
- Table A.10 Total energy consumption per source in Asia 1820-2020 (Mtoe)
- Table A.11 Total energy consumption per source in Middle East 1820-2020 (Mtoe)
- Table A.12 Total energy consumption per source in Africa 1820-2020 (Mtoe)
- Table A.13 Energy consumption per country 1820-2020 (Mtoe)

GHG emissions

- Table B.1 World GHG emissions per macroarea 1820-2020 (Mtons)
- Table B.2 Percentage of World GHG emissions per macroarea per decade 1820-2020
- Table B.3 World energy GHG emissions per gas 1820-2020 (Mtons)
- Table B.4 Percentage of any source on World GHG emissions per decade 1820-2020
- Table B.5 Total GHG emissions in Western Europe 1820-2020 (Mtons)
- Table B.6 Total GHG emissions in Eastern Europe 1820-2020 (Mtons)
- Table B.7 Total GHG emissions in North America 1820-2020 (Mtons)
- Table B.8 Total GHG emissions in Latin America 1820-2020 (Mtons)
- Table B.9 Total GHG emissions in Oceania 1820-2020 (Mtons)
- Table B.10 Total GHG emissions in Asia 1820-2020 (Mtons)
- Table B.11 Total GHG emissions in Middle East 1820-2020 (Mtons)
- Table B.12 Total GHG emissions in Africa 1820-2020 (Mtons)
- Table B.13 Total GHG emissions per country 1820-2020 (Mtons)

Figures

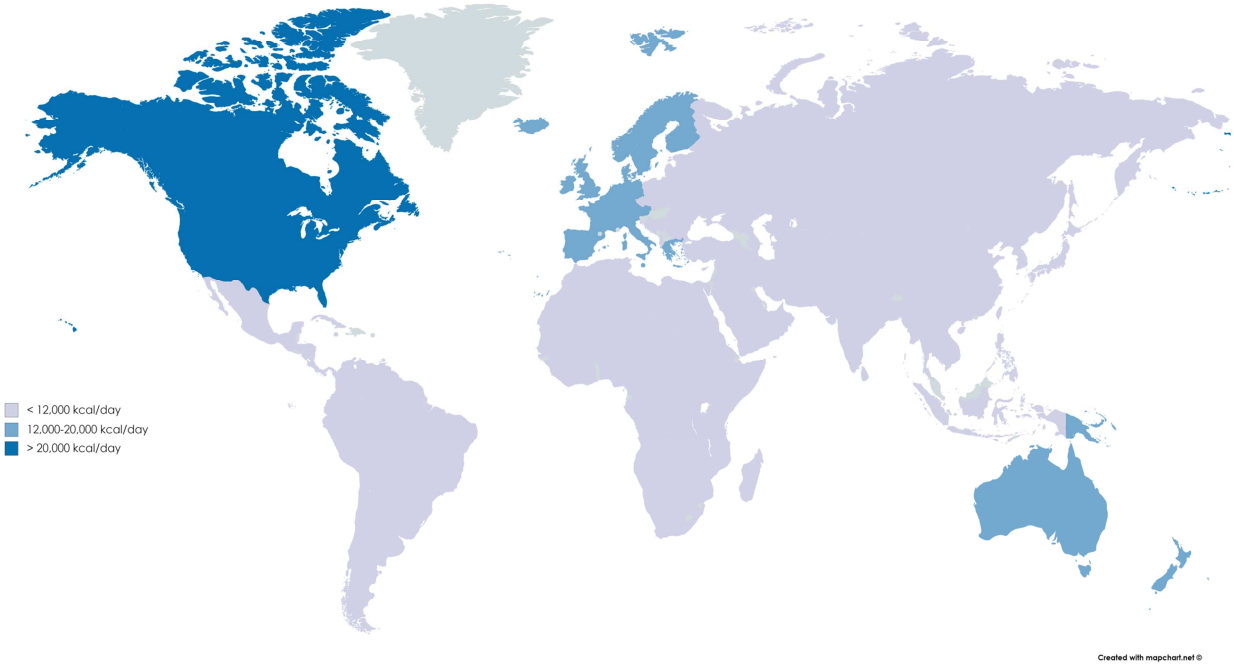
Energy consumption

- Figure A.1 World total and per capita energy consumption 1820-2020 (Mtoe and Koe)
- Figure A.2 Total energy consumption per macroarea 1820-2020 (Mtoe)(log vertical axis)
- Figure A.3 Percentage of total energy consumption per macroarea per decade 1820-2020
- Figure A.4 World and per capita energy consumption per source 1820-2020 (Mtoe and Koe)
- Figure A.5 Percentage of any source on total World consumption 1820-2020
- Figure A.6 Total and per capita energy consumption in Western Europe 1820-2020 (Mtoe and koe)
- Figure A.7 Total and per capita energy consumption in Eastern Europe 1820-2020 (Mtoe and Koe)
- Figure A.8 Total and per capita energy consumption in North America 1820-2020 (Mtoe and Koe)
- Figure A.9 Total and per capita energy consumption in Latin America 1820-2020 (Mtoe and Koe)
- Figure A.10 Total and per capita energy consumption in Oceania 1820-2020 (Mtoe and Koe)
- Figure A.11 Total and per capita energy consumption in Asia 1820-2020 (Mtoe and Koe)
- Figure A.12 Total and per capita energy consumption in Middle East 1820-2020 (Mtoe and Koe)
- Figure A.13 Total and per capita energy consumption in Africa 1820-2020 (Mtoe and Koe)

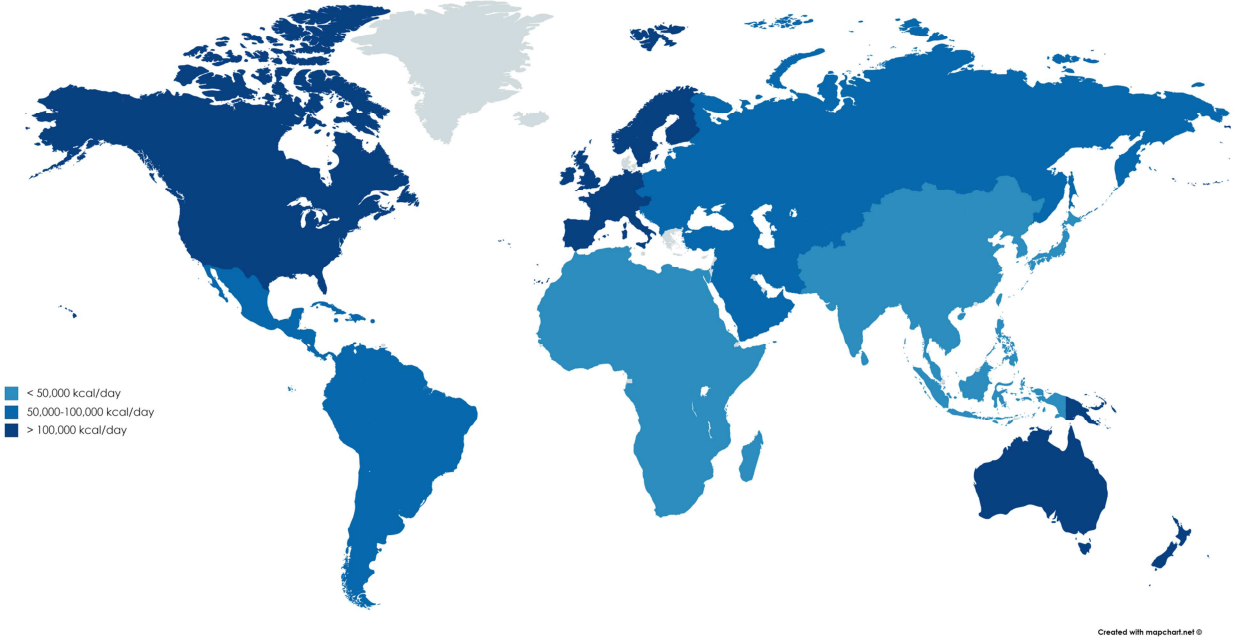
GHG emissions

- Figure B.1 World total and per capita GHG emissions 1820-2020 (Mtons and tons)
- Figure B.2 Total GHG emissions per macroarea 1820-2020 (Mtons)(log vertical axis)
- Figure B.3 Percentage of total GHG emissions per macroarea per decade 1820-2020
- Figure B.4 World GHG emissions per source 1820-2020 (Mtons and tons)
- Figure B.5 Percentage of any source on World GHG emissions per decade 1820-2020
- Figure B.6 Total and per capita GHG emissions in Western Europe 1820-2020 (Mtons and tons)
- Figure B.7 Total and per capita GHG emissions in Eastern Europe 1820-2020 (Mtons and tons)
- Figure B.8 Total and per capita GHG emissions in North America 1820-2020 (Mtons and tons)
- Figure B.9 Total and per capita GHG emissions in Latin America 1820-2020 (Mtons and tons)
- Figure B.10 Total and per capita GHG emissions in Oceania 1820-2020 (Mtons and tons)
- Figure B.11 Total and per capita GHG emissions in Asia 1820-2020 (Mtons and tons)
- Figure B.12 Total and per capita GHG emissions in Middle East 1820-2020 (Mtons and tons)
- Figure B.13 Total and per capita GHG emissions in Africa 1820-2020 (Mtons and tons)

Map 1. World per capita energy consumption in 1820 (Kcal/day)



Map 2. World per capita energy consumption in 2000 (Kcal/day)



Statistical sources and methods

The present work is divided into seven sections. The first is devoted to the geographic coverage of the series of energy consumption; the second to total and per capita consumption per source; the third to traditional sources of energy; the fourth to modern sources; the fifth to the comparison between my results and other series of energy consumption; the sixth to GHG emissions; the seventh to comparisons with other series of GHG emissions and mine. The time frame of any series are the last two centuries, that is from 1820 to 2020.

1. Geographic coverage

The aim of this work is to present the statistical reconstruction of energy consumption in 8 World macroareas and 72 nations. The list of the macroareas is reported in Table 1.

Table 1. The macroareas

1	WE	Western Europe
2	EE	Eastern Europe
3	NA	Northern America
4	LA	Latin America
5	O	Oceania
6	As	Asia
7	ME	Middle East
8	Af	Africa

The macroareas include the following 72 countries always within the same present national borders; with the exceptions of Czechoslovakia, USSR and Yugoslavia, always within pre-1989 borders; USSR includes all the countries of former USSR and the Asian share of the country (Table 2).

Table 2. Countries per macroarea

Western Europe: WE	Eastern Europe: EE	Latin America: LA	Asia: As	Africa: Af
1 Austria	1 Bulgaria	1 Argentina	1 China	1 Algeria
2 Belgium	2 Czechoslovakia	2 Bolivia	2 India	2 Congo RD
3 Denmark	3 Hungary	3 Brazil	3 Indonesia	3 Egypt
4 Finland	4 Poland	4 Chile	4 Japan	4 Ethiopia Eritrea
5 France	5 Romania	5 Colombia	5 Malaysia	5 Libya
6 Germany	7 USSR (and former USSR)	6 Costa Rica	6 Philippines	6 Malawi
7 Greece	6 Yugoslavia (and ex-Yug.)	7 Cuba	7 Thailand	7 Morocco
8 Ireland		8 Dominican R.		8 Nigeria
9 Italy	North America: NA	9 Ecuador	Middle East: ME	9 South Africa
10 Netherlands	1 Canada	10 El Salvador	1 Iran	10 Tunisia
11 Norway	2 USA	11 Guatemala	2 Iraq	11 Zambia
12 Portugal		12 Haiti	3 Israel	12 Zimbabwe
13 Spain	Oceania: O	13 Honduras	4 S. Arabia	
14 Sweden	1 Australia	14 Mexico	5 Syria	
15 Switzerland	2 New Zealand	15 Nicaragua	6 Turkey	
16 UK		16 Panama		
		17 Paraguay		
		18 Peru		
		19 Uruguay		
		20 Venezuela		

The inhabitants of these 72 nations represent a percentage of total World population between 92, in 1820, and 81, in 2020 (Table 3). In Western Europe and North America the excluded population is always less than 0.5 percent and in Eastern Europe less than 1 percent.

Table 3. Percentage of population in our sample of 72 countries on World population (in Table B.1) and on total population per macro-area in 1820, 1900, 2020

	1	2	3	4	5	6	7	8	
	WE	EE	NA	LA	O	As	ME	Af	WORLD
1820	100	99	100	97	27	94	85	53	92
1900	100	99	100	97	82	92	85	62	93
2020	100	99	100	97	72	82	77	54	81

The choice of the eight macroareas depends in part on the geography and in part on practical reasons. For example, Mexico shares a large land border with the United States and is not part of South America. The reasons for its inclusion in Latin America have been widely discussed by Bertola, Ocampo (2012), pp. 1-7. I followed their suggestion. The Middle East is separated from the rest of Asia because of its special characteristics from the viewpoint of a history of energy. Africa could be divided in North and Sub-Saharan Africa, but from the viewpoint of energy (given the inter African flows) there are good reasons for considering the continent on the whole. Western and Eastern Europe present different developments, when energy is taken into account (although the borders between these macroareas are not so easy to define). In any case, in the *Database* I report the series for 72 countries. These national series allow different aggregations. Actually both for WE and NA the population of some countries such as Channel Islands, Iceland, Liechtenstein, Luxembourg (WE) and Bermuda, Virgin Islands (NA) is excluded.

Population per macroarea (*The Database. Per macroarea* Tables A and *The Database. Per country* Tables B) is derived from:

1. Maddison (2010), *Historical Statistics of the World Economy* (until 2008).
2. My series per country have been updated with the UN, *World population prospects: the 2017 Revision* and UN, *World Urbanization Prospects: the 2018 Revision*, UN, *World Population Prospects 2019. Estimates, 1950–2020*.
3. Data per country for LA in 1900-2010 are from *Latin American Population. Moxlad Database*, and after 2010 by the UN series.
4. Data of Czech population are from Srb 1962 until 1960 and then from the UN databases (quoted in 2).
5. Population data for seven Western European countries (France, Germany, Italy, The Netherlands, Portugal, Spain, Sweden), whose energy series are included in the *Energy History* database, is computed from national series (total consumption/per capita consumption) and is updated with Eurostat data until 2020. Data after 2016 are from *United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition*.
6. For Oceania prior 1950, data per country by Maddison have been completed with data from Caldwell, Missingham, Marck (2001), pp. 3-5.
7. For the following African countries in the 19th and early 20th centuries, I used the database by Jan Lahmeyer, *Population Statistics*, <http://www.populstat.info>, completed with: Congo RD (UN database from 1950), Nigeria (UN database from 1950), Zambia (Maddison (2010) from 1993), Zimbabwe (Maddison (2010) from 1993). From 2010, UN, *World Urbanization Prospects: The 2018 Revision* and *United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition*.

Data on total energy consumption (in the Database. Per macroarea, Tables A 1-13) has always been adjusted to total population of any macroarea, multiplying any consumption by the ratio between total population of any macroarea and the population of the nations included in our Database (with the exception of Oceania; see the following section 4. Modern Sources. Oceania). E.g.: data on energy consumption in the Middle East in 2020 does not refer to 77 percent of the population of those countries included in my reconstruction per nation, but to the entire population of the macroarea.

2. Total and per capita energy consumption per macroarea and per source

Databases of energy consumption deal always with *primary sources of energy*, that is inputs of energy which have only been superficially transformed by human work, or are not transformed at all, before entering the productive or domestic exploitation. By contrast, *secondary energy carriers* are those heavily transformed from their natural form. Otherwise stated: “the term primary energy is used to designate an energy source that is extracted from a stock of natural resources or captured from a flow of resources and that has not undergone any transformation or conversion other than separation and cleaning” (Bhattacharyya (2011), p. 10). For instance: charcoal is a secondary source of energy. In our series of energy consumption, it is computed as the firewood (specifically its caloric content) utilized to produce such charcoal; similarly electricity produced in coal-fired power stations is included in the series as the coal used to produce such electricity (for Primary Electricity see the following section § 4). For a definition of primary energy and the methods for a quantification of traditional sources of energy, see Kander, Malanima, Warde (2013), ch. 1 and 2, Malanima (1996), (2006), Kander (2002), Warde (2007), Teives Henriques (2009), (2011), Unger, Thistle (2013), Bartoletto (2012). On definitions and measurements in the field of energy, see UN (1987).

Energy consumption by weapons (from gun powder to nuclear energy) is excluded. Excluded is also the consumption of water and wind power in the traditional economies (primarily exploited for watermills and ships). Water and wind power are instead included in primary electricity (which does not include electricity generated by coal, oil and gas).

Primary energy sources included in the *Database* are:

1. food for humans
2. fuelwood
3. fodder for working animals
4. coal
5. oil
6. natural gas
7. electricity (from water, wind, geo, Sun and other renewables)
8. nuclear
9. biofuels

The series in the following *Database* are the summary tables with total yearly consumption per macroarea (per year) and decadal consumption per country including both traditional and modern sources of energy (*Database. Per macroarea, Database. Per country*). The criteria for the calculation are reported in section 3 (traditional sources) and 4 (modern sources).

Data on energy in the present *Database* are in Mtoe per year. This unit of measurement is among the most used in the available international databases and is a multiple of Cal or Kcal.

A Toe is the caloric equivalent of a ton of oil and then 10 Million kcal. A Mtoe is a million of Toes. In some per capita estimates is used the Koe as well, equal to the caloric content of a kg of oil, that is 10,000 kcal.

In summary, the measures utilised in this *Database*, and their equivalent in Joules and multiples of Joule, are:

Mtoe	10^{13} Kcal	= 41.868 Petajoules (Pj)
Toe	10^7 Kcal	= 41.868 Gigajoules (Gj)
Koe	10^4 Kcal	= 41,868 Kilojoules (Kj)
Kcal	1	= 4186.8 Joules (J)

For a conversion from Mtoe into a variety of different sources, see:

<http://www.onlineconversion.com/energy.htm>

<https://www.iea.org/statistics/resources/unitconverter/>

Given the difficulties in reconstructing traditional sources, they have been calculated only for the macroareas (with the exceptions of part of Western Europe and North America), while the series of modern sources are the sum of national series for each carrier in our sample of 72 countries (then adjusted to macroareas).

Generally speaking, throughout the preparation of the series of total energy consumption, two different procedures are followed for primary traditional and primary modern sources:

1. *Traditional sources*: I collected scattered information for any macroarea on the three traditional sources, computed per capita consumption, finally multiplied by total population of any macroarea. The exceptions are part of Western Europe (WE) and North America (NA), well documented by specific researches. For these countries I exploited the already available annual series per source (such as specified in the following notes). Then, with the exception of part of WE and NA, total consumption for any of the 72 countries includes the traditional energy computed for the macroarea of which the country is part.

2. *Modern sources*: I reconstructed annual series of total consumption for any of our six modern sources for 72 countries over 200 years (1820-2020). In some cases, I employed interpolations as it will be shown in the following information on any country).

For any country (with the exceptions of the same Western European countries and North America) total energy consumption is the sum of the traditional energy consumption of the macroarea (adjusted to the population of the macroarea) and the modern energy consumption of the specific country. For example, the total for Nigeria includes the modern sources computed for the country plus the traditional energy computed for the macroarea of which Nigeria is part (Africa).

3. Traditional sources

The following are the three traditional sources of energy included in the *Database*:

1. *food* for human beings; the original input of energy;
2. *fuel* –ordinarily firewood-; which is the main energy carrier since the start of its exploitation through fire between 1 and 0.5 million years ago;
3. *fodder* consumed by working animals (considering working animals as biological machines and fodder as their input of energy), exploited since the neolithic agricultural revolution.

The exploitation of water (by mills and other engines) and wind (by sail ships and mills) is excluded from the following series of traditional sources. For WE and NA we could avail of direct measurements such as those in Kander, Malanima, Warde (2013), ch. 1 and 2, Malanima (1996), (2006), Kander (2002), Warde (2007), Teives Henriques (2009), (2011), Unger, Thistle (2013), O'Connor, Cleveland (2014), Gales, Kander, Malanima, Rubio (2007). Yet information for the other macroareas is not enough for a quantification. In any case, while water and wind are remarkable in terms of power that is energy delivered in the unit of time, in terms of energy consumption they represented less than 1 percent of total consumption and often less than 0.5 percent see Kander, Malanima, Warde (2013), pp. 64-70). In Court 2016 water and wind power represent 0.85 per cent of total consumption in 1820. Their exclusion from the present estimates does not compromise the results. Water and wind included in the series of modern sources are those used to produce electricity (then they are included in *Electricity*).

The availability of traditional energy sources in the past agrarian economies was subject to sharp volatility due to yearly changes in the harvests (both of grains and firewood) and epidemics of working animals. Since our series refer to wide macroareas, we can assume that bad harvests (and other accidents) in a region or nation were compensated by good harvests elsewhere and that the curve of energy consumption per macro-area was more stable than that for a nation. In any case, the availability of data on pre-modern energy consumption results in much smoother series than it actually was.

Only for France, Germany, Italy, The Netherlands, United Kingdom, Portugal, Spain, Sweden, USA and Canada we can avail of national estimates of traditional sources. For Finland and Norway per capita consumption of traditional sources is assumed equal to that of Sweden. For the other West-European countries, per capita consumption is assumed equal to the average of France, Germany, Italy, The Netherlands, Portugal, Spain (England has been excluded since firewood consumption

ran out after 1848, as shown by Warde (2007). For NA, total consumption is the sum of the consumption of US plus Canada. For the remaining six macroareas it is not yet possible to compute national estimates of traditional sources and therefore neither total consumption for any macroarea. We may, however, estimate magnitudes of per capita consumption per macroarea following the criteria explained below. Per capita calculations for these six macroareas (EE, LA, O, As, ME, Af) have been then multiplied by the population of any macro-area.

The margins for error of the estimate of traditional sources are certainly wider than those of modern commercial sources (and, such it is shown in the following section 5 on the results of my statistical reconstruction). These margins of uncertainty diminish for food as we approach modern times, but do not diminish for working animals and wood fuels, which are hard to estimate even in the 21st century. In any case, as written by A. Robinson in Deane 1948, p. IX: “there is no reason to regard zero as a closer approximation to the truth than a reasonable guess.”

Food

The historical range of food intake by a human being is relatively narrow. Following FAO's tables on age and sex-specific food requirements (Dary, Imhoff-Kunsch, (2010), p. 5) and https://www.cnpp.usda.gov/sites/default/files/usda_food_patterns), we could proxy food consumption in the past with a modest margin of error. The series by FAO show that in the decades 1964-2015 food intake in kcal per capita rose from a minimum of about 2,000 to a maximum of 3,500 (Table 4); and also Goklany (1999) p. 109, for the period 1930-92. We could assume that in about 1820 per capita consumption of food was around 2,000 kcal per day and that it rose to 3,000-3,500 at the start of the third millennium. I tried, however, to specify, whenever possible, food consumption on the basis of available quantitative evidence. A useful analysis of the available databases on food consumption, you can see Szűcs, Szabó, Bánáti (2013). Useful, but not certain, data for the 1940s and 1950s is provided by FAO (1955) and FAO (1965).

Table 4. Daily food intake per capita by FAO in 1964-2030 (kcal)

	1964-66	1974-76	1984-86	1997-99	2015	2030
World	2,358	2,435	2,655	2,803	2,940	3,050
Developing countries	2,054	2,152	2,450	2,681	2,850	2,980
Sub-Saharan Africa	2,058	2,079	2,057	2,195	2,360	2,540
Near East/North Africa	2,290	2,591	2,953	3,006	3,090	3,170
Latin America and the Caribbean	2,393	2,546	2,689	2,824	2,980	3,140
South Asia	2,017	1,986	2,205	2,403	2,700	2,900
East Asia	1,957	2,105	2,559	2,921	3,060	3,190
Industrial countries	2,947	3,065	3,206	3,380	3,440	3,500
Transition countries	3,222	3,385	3,379	2,906	3,060	3,180
Memo items						
1. World, excl. transition countries	2,261	2,341	2,589	2,795	2,930	3,050
2. Developing countries, excl. China	2,104	2,197	2,381	2,549	2,740	2,900
3. East Asia, excl. China	1,988	2,222	2,431	2,685	2,830	2,980
4. Sub-Saharan Africa, excl. Nigeria	2,037	2,076	2,057	2,052	2,230	2,420

Source: FAO Prospects for food and nutrition:
<https://www.fao.org/3/y4252e/y4252e04.htm#TopOfPage>

For *Oceania, Latin America, Asia, Middle East, Africa*, however, we lack direct information until a recent period. Decadal estimates are, then, based on cross-section regressions of food as a function of income for the last two decades, following Bodirsky, Rolinski, Biewald, Weindl, Popp, Lotze-Campen (2015). For per capita GDP, I used the series in *Maddison Project Database* (2013 edition) for the regressions. From 1948 we can avail of direct FAO estimates for any country in FAO 1965 (years 1948-64, in FAO's database on food consumption (*FAO Food security portal*))(1961-2013 and 2014-18). My results tally with those in 1970-2015 by Kearney (2010), p. 2794. The apparently high standards of caloric intake in 1820-50 fit the FAO's standards, as shown by Humphries (2013), pp. 698-99. The amount of 2,000 kcal per day has been suggested as a reliable average for pre-modern popula-

tions by Livi Bacci (1987), p. 43. For China in particular data from FAO are completed with Smil (1986).

Western Europe (WE): rough estimates of food consumption are available for the following countries: Italy, Spain, Portugal, France, Germany, England and Wales, The Netherlands and Sweden (*Energy History* database). These series have been completed for the years from 2000 through the database *Daily per capita Supply of Calories and Food Consumption (Eurostat Database)*. For the other Western European countries, not included in this sample, I assumed the same average per capita consumption of those eight countries. Floud, Fogel, Harris, Chul Hong (2011), p. 268 (Tab. 5.5) record the available information for Western European countries since 1800. This information has been used to check my results. Updated series are available in *EUROSTAT. Daily Calorie Supply per Capita by Source*.

Eastern Europe (EE): for the period from 1961, I exploited *FAO's database* (the average of Poland, Bulgaria, Czechoslovakia –and Czechia plus Slovakia-, Hungary, Romania, Russia –and nations of former USSR-, Yugoslavia –and former Yugoslavian countries-). For the previous period, I regressed per capita consumption of food (FC in kcal) in Western Europe on per capita GDP (y) from *Maddison Project Database* (2013 edition). The result is: $FC = 730.64 + 243.28 \ln(y)$ ($R^2 = 0.85$). I used the equation with per capita GDP of Eastern Europe from *Maddison Project* and computed the entire series.

Northern America (NA): for the US I made use of the series by Floud, Fogel, Harris, Chul Hong (2011), p. 314; and for Canada I took the series from Unger, Thistle (2013). Since the level and trend of both series are similar, for the macroarea on the whole I computed the arithmetic average.

Table 5. Daily food intake per decade (in kcal per capita) 1820-2020

kcal	WE	EE	NA	LA	O	As	ME	Af	WORLD
Food									
1820	2,486	2,257	2,905	2,198	2,161	2,189	2,232	2,159	2,241
1830	2,477	2,276	2,912	2,199	2,256	2,188	2,239	2,172	2,245
1840	2,554	2,296	3,005	2,200	2,376	2,186	2,246	2,185	2,264
1850	2,628	2,315	2,630	2,201	2,480	2,184	2,253	2,198	2,273
1860	2,611	2,326	2,838	2,206	2,588	2,182	2,260	2,211	2,284
1870	2,625	2,338	3,032	2,211	2,625	2,181	2,267	2,224	2,301
1880	2,608	2,385	3,224	2,228	2,694	2,199	2,287	2,242	2,330
1890	2,618	2,409	3,125	2,246	2,704	2,217	2,308	2,260	2,350
1900	2,636	2,470	3,196	2,266	2,686	2,235	2,328	2,278	2,381
1910	2,754	2,501	3,063	2,294	2,757	2,254	2,349	2,297	2,414
1920	2,612	2,309	3,239	2,316	2,740	2,257	2,376	2,302	2,384
1930	2,691	2,533	3,351	2,332	2,730	2,266	2,406	2,300	2,437
1940	2,611	2,591	3,280	2,345	2,805	2,238	2,436	2,299	2,414
1950	2,542	2,722	3,176	2,378	3,170	2,233	2,467	2,318	2,412
1960	2,856	3,033	3,088	2,429	3,098	2,093	2,659	2,360	2,408
1970	3,146	3,268	3,194	2,542	3,127	2,252	2,806	2,435	2,552
1980	3,245	3,408	3,173	2,689	3,048	2,405	3,069	2,566	2,668
1990	3,335	3,314	3,460	2,637	3,160	2,475	3,263	2,630	2,715
2000	3,424	2,942	3,749	2,791	2,998	2,690	3,160	2,717	2,839
2010	3,427	3,307	3,633	2,958	3,217	2,766	3,186	2,848	2,928
2020	3,448	3,313	3,769	3,026	3,384	2,886	3,268	2,742	2,988

Source: see text.

Oceania (O), Latin America (LA), Asia (As), Middle East (ME), Africa (Af): in order to establish a relationship caloric intake-income, I took data on per capita GDP in PPP dollars 2011 for 2007 from World Bank WDI and food consumption from FAO's database for the years 2007-09 (154 countries), and regressed food consumption (FC in Kcal) on per capita GDP (y) with a power equation (the best fit). The estimated equation is: $FC = 1078y^{0.1028}$ ($R^2 = 0.4966$). I used the historical series of per capita GDP in Europe from *Maddison Project Database* (2013 edition) (in PPP 1990 Geary-Khamis \$); that is I converted the series into 2011 \$ PPP, multiplying by 1.77, and using the previous equation in order

to estimate the whole series. For the last decades I followed FAO's series. The database *Daily per capita supply of calories* was exploited to check my results. The estimates by CEPAL (1976), p. 47 for LA in 1961, 1965, 1970-73 are very close to mine. For China, from 1929, Smil (1986), Tab. 2.

My results per macroarea per decade are summarised in Table 5.

Fuel

The range of error for any quantification of fuelwood consumption is more remarkable than that of food consumption. Any estimate, even for present economies, suggests mere magnitudes of fuelwood consumed. Certain data is not available. The widest database is provided by *FAO fuelwood Statistics* and is based on estimates rather than on direct information. For eight countries in Western Europe (France, Germany, England, Italy, The Netherlands, Portugal, Spain, Sweden), my sources are Kander (2002), Malanima (2006), (2013), Warde (2007), Teives Henriques (2009), (2011), and the database *Energy History*. For the UK, I multiplied per capita consumption in England & Wales from Warde 2007 by the population of the UK. In 19th and 20th century peat was used as fuel (O'Carroll 2004). Peat is included as a fuel (in modern sources of energy). For Finland and Norway, I assumed the same per capita value of Sweden; for Austria, Belgium, Denmark, Greece, Switzerland I took the average for the eight countries for which the series are available. For NA, data comes from O'Connor, Cleveland (2014) and Unger, Thistle (2013). The very high fuelwood consumption in US 1820-50 is confirmed both by U.S. Energy Information Administration Annual Energy Review, Tables 1.3, 10.1, and E1 <https://www.eia.gov/totalenergy/data/annual/>, and Netschert, Schurr 1960, p. 48. Higher estimates for Spain are proposed by Iriarte-Goñi, Infante-Amate (2017) and (2019).

The calories of wood depend on several variables and primarily quality of wood and moisture. I assumed the caloric content of 3,000 Kcal per kg (which is an average of the plausible data). See, on the topic: UN (1987), pp. 32-35. A remarkable contribution on the topic of wood during the energy transition is Warde (2019).

Since the available series for WE and NA confirm data elaborated, with an indirect method, by Fernandes, Trautmann, Streets, Roden, Bond (2007), the present series exploit the estimates of their article for my macroareas. Fernandes et al. combined "estimates of per capita biofuel use with population data, taking into account country-specific factors that might have caused per capita consumption rates to change over time". Given that in the article by Fernandes et al. data refers to total consumption and are presented in Teragrams per macro-area (and their macroareas do not correspond to mine), to compute per capita values I exploited the original data of the article for population (provided by one of the authors, David Streets, whom I thank for his generosity). Thanks to population data, I recalculated consumption in kg per day per capita for my eight macroareas. For the three decades 1820-50, I assumed for EE, LA, O, As, ME, Af a stable consumption (kg per day per person), equal to that of 1850. The assumption seems plausible in the light of the long-term stability in average fuelwood consumption per capita (at least before the energy transition).

Table 6. Ratio between the series by FAO and those by Fernandes et al. (2007) 1961-2000

	WE and EE	NA	LA	O	As	ME	Af	World
1961	0.78	0.41	1.02	0.35	0.77	0.27	0.83	<i>0.83</i>
1970	0.80	0.34	1.05	0.35	0.67	0.31	0.86	<i>0.79</i>
1980	0.78	0.43	1.13	0.36	0.63	0.29	0.86	<i>0.77</i>
1990	0.94	0.57	1.05	0.32	0.54	0.14	0.94	<i>0.74</i>
2000	0.58	0.70	1.16	0.30	0.46	0.08	0.95	<i>0.70</i>

Sources: see text.

The years 1961-2015 are covered by *FAO Fuelwood Consumption Statistics* (see also Otepka, Grynenko (2018) for a comparison). In order to compare the results of the FAO database with data from the article by Fernandes et al., I computed for any year 1961-2015 the sum, for any country, of coniferous and nonconiferous wood, charcoal, wood residues and pellets, provided by *FAO Fuelwood Consumption Statistics*. For a comparison is also useful Arnold, Köhlin, Persson, Shepherd (2003), whose data from 1970 onward are based on FAO series. FAO data results lower for than those availa-

ble for the eight European countries covered by the *Energy History* database and lower than those by Fernandes et al. (see also the FAO results in Johnson, Tella, Israilava, Takama, Diaz-Chavez, Rosillo-Calle, et al. (2010), pp. 14-5). A ratio between the estimates by FAO and those by Fernandes et al. is provided in Table 6.

For EE, LA, O, As, ME, Af, I utilized data from Fernandes et al. (2007) from 1850 until 2000. For the years 2001-20 I used the annual rates of growth by *FAO Fuelwood Consumption Statistics* on the estimate by Fernandes et al. for 2000. For world's macroareas I exploited Arnold, Köhlin, Persson, Shepherd 2003, Tab. 2. For 2019-20 I assumed the same per capita data of 2018. In order to compute kg per day from FAO's dataset, I used the following coefficients:

- 1 kg of charcoal = 7,000 kcal = 5 kg of wood
- 1 kg of wood = 3,000 kcal
- 1 kg of pellets = 4,500 kcal
- 1 cubic metre of wood = 650 kg
- 1 cubic metre of pellets = 650 kg
- 1 cubic metre of wood residues = 300 kg

Data on fuelwood consumption per capita based on data by FAO are presented in Table 7.

Table 7. Data of fuelwood consumption in kg per capita per day by FAO 2000-15

	WE	EE	NA	LA	As	ME	Af	O	World
2000	0.15	0.19	0.91	1.16	0.42	0.06	1.58	0.78	0.59
2010	0.18	0.31	0.81	0.96	0.38	0.05	1.52	0.57	0.57
2015	0.24	0.41	0.87	0.98	0.36	0.04	1.44	0.53	0.58

Sources: see text.

The results of my calculations in kcal per capita per day are summarised in Table 8.

Notice the increase of fuelwood consumption in Europe 2000-16 (due mainly to the spread of pellets and the economic policy of EU in favour of non fossil fuels).

Table 8. Kcal per capita per day from fuelwood 1820-2020

kcal	WE	EE	NA	LA	O	As	ME	Af	WORLD
Fuelwood									
1820	5,511	6,782	61,811	4,580	16,867	4,330	3,869	7,175	5,487
1830	5,097	6,782	63,454	4,580	16,867	4,330	3,869	7,175	5,621
1840	5,036	6,782	64,057	4,580	16,867	4,330	3,869	7,175	5,826
1850	4,747	6,782	63,085	4,580	16,867	4,330	3,869	7,175	6,077
1860	4,666	6,515	59,510	4,767	27,714	4,312	3,869	7,057	6,386
1870	4,224	6,603	50,649	4,801	30,596	4,282	3,869	6,844	6,381
1880	3,801	6,489	41,402	5,020	35,001	4,308	3,851	6,988	6,256
1890	3,477	6,243	29,699	5,350	36,010	4,306	3,830	6,939	5,909
1900	3,164	5,974	19,822	5,594	33,727	4,296	3,839	6,927	5,461
1910	2,796	5,465	14,527	6,240	31,297	4,289	3,879	6,963	5,172
1920	3,082	4,846	11,124	6,271	15,313	4,216	3,863	6,936	4,901
1930	2,612	4,368	8,918	6,371	8,832	4,165	3,888	6,893	4,639
1940	2,789	4,092	7,421	6,198	8,085	4,061	3,760	6,866	4,486
1950	2,436	3,475	7,441	6,314	8,386	3,990	3,712	6,812	4,400
1960	2,313	2,663	4,737	5,407	8,224	3,995	3,390	6,453	4,065
1970	2,385	1,940	4,321	3,869	5,896	3,768	1,982	5,322	3,620
1980	2,458	1,475	6,663	2,769	4,375	3,400	1,159	4,389	3,333
1990	2,796	1,217	5,459	2,049	3,466	3,231	715	3,690	3,029
2000	3,015	863	4,876	1,733	3,931	2,969	554	3,615	2,822
2010	3,245	1,053	3,900	1,673	2,639	2,297	397	3,477	2,407
2020	3,288	1,026	3,801	1,530	2,464	1,877	270	2,970	2,091

Sources: see text.

Fodder for working animals

An assumption to quantify the ratio draught animals/population is that in many cases (although not always, as we will see), its magnitude, depending on the structure of past agricultural economies and their features in different parts of the World, is more or less stable for long periods (in relation to the population). Before the start of the agricultural modernization, we lack of any quantitative information. Only for the earlier modernising economies, WE, NA and O, we can avail of better evidence than for the rest of the World.

Part of the livestock enters the estimate of energy consumption in the form of food (meat, milk...) for humans and is already included in the estimate of food intake (previous Table 5). Another contribution of the livestock to energy consumption is through its work. Although livestock series are available (ordinarily for the twentieth century, Mitchell (2013), it is not easy to distinguish the share employed in work. Ordinarily, horses, mules, asses, camels are employed either in work or transportation, with the exception of animals which are too young (assumed in the following calculations equal to 20 percent). For cattle, it is different and, in many cases, we can not distinguish working animals from the rest. Ordinarily calves and milk cows do not work; although exceptions are far from rare. For modern countries, Matthewman, Dijkman, Zerbini (w.d.) write that “parts of the World where cows are used to provide draught power include Bangladesh, Indonesia, Pakistan, Philippines, Thailand, Sri Lanka, Poland, Senegal, Egypt, Zambia, Zimbabwe, Guadalupe”. To this list we could easily add many more countries in Africa and in several countries of Latin America. Furthermore from country to country the share of working cattle is different and changes in time (diminishing whenever we approach the present). The methods I followed are different for each macroarea. Useful information on power and employment of diverse animals in agriculture can be found in *Animal Traction in Rainfed Agriculture in Africa and South America* (1991) and Goe, McDowell (1980).

In order to quantify the contribution of working animals to human energy consumption, I followed the method employed by Kander and Warde (2011). The rationale behind their calculation is to consider a draught animal as a machine and fodder intake as the fuel the machine has to burn in order to work. The method implies the conversion of any draft animal into horse equivalents and then to establish the ratio horse equivalents-population for any country or macroarea, to multiply horse equivalents per person by a daily food intake of 23,000 kcal by an horse equivalent and finally multiply the result by 365 days and by the population of the country or area. For the conversion into horse equivalents (any horse equivalent equal to 1), the coefficients for other animals are (on the basis of their relative power): for a mule 1, for ox and buffalo 0.67, for donkey 0.3, for camel 1.

The specific calculation is different for any macro-area or nation and different are the sources. For a general view of the employment of working animals in the World about 2000, I used Lhoste, Havard, Vall (2010), p. 12, whose figures are summarised in Table 9.

Table 9. World working animals per species in about 2000 (000,000)

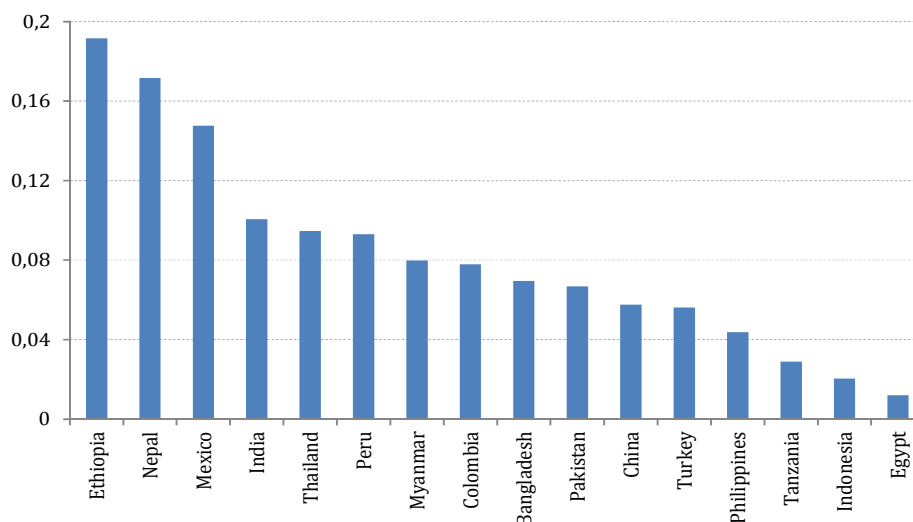
	As	LA	Af	Others	TOTAL
millions					
Oxen and Buffaloes	270	15	16	0	301
Horses	16	24	5	13	58
Donkeys and mules	23	7	17	9	56
Dromedaries and camels	4	0	15	0	19
TOTAL	313	46	53	22	434

Source: Lhoste, Havard, Vall (2010), p. 12.

An estimate per country is provided by Ramaswamy (1985), (1994), according to whom, for the years around 1980-90, in the World “the population of draught animals may be estimated at approximately 400 million (300 million adult animals and 100 million young stock)” (1994), p. 196; and see the critical comments by Starkey (2010), pp. 15-6). Horse equivalents per capita for a sample of

countries are presented in Figure 1. Useful is Alexandratos, Bruinsma, Hrabovszky (1982) who collects data on working animals for 90 countries in 1975 and projections for 2000.

Figure 1. Horse equivalents per capita (ratio horse equivalents-population) in a sample of countries 1980-90



Source: Ramaswamy (1985), p. 3.

Western Europe: for WE my estimates follow the series already available in Kander and Warde (2011). Those series are based on direct data from coeval documents and concern Sweden, The Netherlands, England, Germany, France, Spain and Italy in the period 1815-1913 (Italy from 1861 and Spain from 1870). I report here my elaboration of that data (Table 10), taken as representative of WE on the whole (data in col. 1, 2, 3, 4, 5 in thousands).

Table 10. Estimates by Kander-Warde of working animals in Sweden, The Netherlands, England, Germany, France, Spain and Italy, Heq and Kcal of fodder per inhabitant in 1815-1913

	1	2	3	4	5	6	7	8	9
	Horses	Oxen	Mules	Donkeys	Horse eq.	Population	Horse eq.	Mtoe	Kcal per c.
	(000)	(000)	(000)	(000)	(000)		per c.	per year	per day
1815	4,338	3,982	275	312	7,331	70,054,807	0.10	6.15	2,407
1840	4,737	4,012	294	326	7,827	88,004,837	0.09	6.57	2,046
1850	4,953	4,012	320	363	8,081	94,888,637	0.09	6.78	1,959
1860	5,568	5,416	252	304	8,243	126,168,072	0.07	6.92	1,503
1870	5,902	6,256	264	300	8,093	150,599,666	0.05	6.79	1,236
1880	5,763	6,232	252	286	7,906	162,490,334	0.05	6.64	1,119
1890	5,999	6,421	233	264	8,180	174,565,972	0.05	6.87	1,078
1900	6,728	6,223	271	308	8,715	189,313,519	0.05	7.32	1,059
1913	7,342	5,905	154	288	8,568	211,597,050	0.04	7.19	931

Source: personal elaboration of the series in Kander and Warde (2011).

Note: in col. 8 Heq of col. 7 are multiplied by their daily consumption of fodder and by 365. In col. 8 the rise in 1860 and 1870 depends on the inclusion of Italy and Spain (lacking for the years 1815-50).

For WE after 1913 I exploited the series in *Energy History Database* (where the authors follow the same method of calculation used in the present *Database* and in Kander-Warde (2011)).

Eastern Europe: data for Bulgaria cover the period 1900-95 (in Barzev (2004), and Vlaeva, Barzev, Georgieva, Ivanova (2017)). Data for Czechoslovakia, from Kuskova et al. *Energy consumption in Czechoslovakia* (and Kuskova, Gingrich, Krausmann (2008)), confirm the similarity of horse

equivalents per capita between EE and WE (especially between Czechoslovakia and Germany), such as shown also by Nielsen (2017). Data from Spulber (2003), pp. 77-8 on horses are not far from those of WE (Table 11).

Table 11. Heq estimate including only horses for a sample of countries in EE 1938-55

	Czechoslovakia	Poland	Hungary	Romania	Bulgaria	Yugoslavia
1938	0.045	0.126	0.101	0.131	0.089	0.079
1948	0.051	0.096	0.062	0.059	0.077	0.062
1953		0.104	0.071	0.064	0.063	0.067
1955	0.053	0.110	0.074	0.069	0.063	0.072

Source: Spulber (2003), pp. 77-8.

Data in Table 11 refers only to horses. I, then, regressed horse equivalents in WE on Western European per capita GDP. The resulting equation is $y = 110.99e^{-2E-04x}$, $R^2 = 0.9856$. In order to obtain the series of horse equivalents for EE, I used this same equation on the series in *Maddison Project* (2013 edition) relative to per capita GDP in EE.

North America: present series report the original yearly series in O'Connor, Cleveland (2014) for the US and Unger, Thistle (2013) for Canada.

Latin America: beef and dairy cattle played an important role in Latin America in the centuries I deal with and continue to play a remarkable role (Jarvis 1986). As a consequence, within the figures relating to cattle, it is hard to specify the percentages of working animals. A reliable source covers 20 countries in the year 1975 (Alexandratos, Bruinsma, Hrabovszky (1982), pp. 148-50), when the ratio draught animals-population was 0.04 (and then equal to the European average in 1913). For the years 1835-2016 and 1892-2000 two annual series are available: for Chile (unpublished, worked out by César Yáñez, who kindly shared with me the results of his research; I seize the opportunity for thanking him) and for Uruguay (Bertoni in *Energy History* and Bertoni, Cancela (2010). Based on Mitchell (2013), I collected and worked out the whole yearly series (with several missing years) for Cuba, Mexico, Brazil, El Salvador and Argentina. These estimates were completed with other quantitative information for Cuba in 1892-2000 (Henriksson, Lindholm (2000), Ríos, Cárdenas (2003)), Mexico in 1930-90 (Ortiz-Laurel, Rössel (w.d.)), Latin America on the whole in 1950-70 (Biswanger, Donovan, (1987), p. 71). For cattle, I assumed in my calculations that only 10 percent was working. In any case, the results for some LA countries are too high. For Argentina in 1875, the ratio horse equivalents-population is equal to 2.00, which led to the exclusion of Argentina. The figures for Uruguay as well seem too high, given the wide breeding of livestock in the country: 0.68 in 1892, 0.20 in 1950 and 0.07 in 2016. The averages among the other countries result, however, in relatively high figures for the ratio horse equivalents-population: 0.15 for 1835 (assumed also for 1820-34), 0.21 for 1900, 0.20 for 1950, 0.04 for 1975 and 0.03 for 2016. On the whole, the series of Chile by Yáñez appears to be more plausible. I adopted it for my calculations of the average for the LA macro-area.

Oceania: in Oceania only horses were used as draught animals. The entire series of horses is provided by Mitchell (1998a, 2013) and start in 1852 for Australia and 1850 for New Zealand. We know that the horses were only 3,500 on the whole in 1820 Australia. Missing data for 1820-50 have been interpolated.

Asia: the only estimate for China at the start of the nineteenth century is provided by Ad-head (1974, 1997) and Debeir, Deléage, Hémerly (1986), p. 109, on the basis of Braudel (1979), I, ch. V; from 1949 yearly data is from Hunter Colby, Crook, Webb (1992), p. 137 (Table 114, "Animals for draft use", about 66 percent of total animals); from 1957 Biswanger, Donovan (1987) Table B-3, p. 69; Naughton (2007), pp. 263-64 from 1949; Cartier (1993, 1999, p. 190) for 1930 and 1990. For China some data for the years 1914-44 are recorded by Mitchell (1998a). I assumed that working animals were 66 percent of the total, such as in 1945-50. From 1820 until 1914, I assumed the same horse-equivalents of 0.06 per person, such as in 1914-50 and 1820. For India, data is only available from 1945, additionally only cattle and buffaloes (corresponding to 0.67 horses, as said earlier) were employed as working animals. In 1945-70 draught animals represented 34 percent of the to-

tal Cattle plus Buffaloes (recorded in Mitchell (1998a). Since Mitchell reports data from 1890, for the period 1890-1945 I assumed that working animals were 34 percent of total cattle and buffaloes. For the period 1820-1890, I assumed that the ratio horse equivalents-population was equal to 0.06 (such as in 1890). From 1945-77 I take data from Biswanger, Donovan (1987), p. 70; from 1972 until 1977 Natarajan, Chander, Bharathy (2016); Mrema, Soni, Rolle (2015), p. 27 for 2005 and 2015 (with projections for 2030 and 2050); Singh (2015), p. 70, and for 1960-2010 (per decade); FAO (2013), p. 106. For Pakistan Lateef, Hanjra (1992), p. 127 and for Bangladesh 1965-80, Jabbar (1980), p. 4. Data for Taiwan 1960-69 in Peng Tien-song (1971), p. 109, confirm the estimate for China in 1960, and a faster decline than for China in the following decade. For Japan 1880-1984, Biswanger, Donovan (1987), p. 67. After 1984 draught animals are no longer employed in Japan. For the calculation of traditional energy in Asia I finally built a weighted average of data for China, India (including Bangladesh from 1950) and Japan.

Middle East: UN (1951), p. 50 (with data for 1937-51 for Iran, Iraq, Turkey, Syria). For Turkey and Iran, we can avail of the series in Mitchell (1998a and 2013) on livestock from 1945 for Turkey and 1930 for Iran; and UN (1953); Gifford (1981), p. 17 for 1980-2000. For Iran from 1995-2010, there are also estimates by Tabatabaeefer, Omid (2005), p. 142. The series by Mitchell and UN (1951 and 1953), completed by *İstatistik Göstergeler Statistical Indicators 1923-2013* (2013), pp. 200-01, for the period from 1929, report data for Iran, Iraq, Turkey, Syria and refer to livestock on the whole (including, that is, non-working animals). I assumed that 0.8 horses, donkey and mules actually worked. For cattle, the percentage was much lower. I assumed that only 0.3 of cattle was employed in transport and agriculture. For the nineteenth century I assumed the same ratio animal-population of the first documented years of the twentieth century.

Table 12. Kcal per capita per day from fodder consumed by working animals 1820-2020

kcal	WE	EE	NA	LA	O	As	ME	Af	WORLD
Fodder									
1820	2,160	2,730	6,454	3,496	238	1,395	1,774	2,300	1,776
1830	2,128	2,711	6,673	3,496	723	1,395	1,768	2,300	1,798
1840	2,153	2,685	6,992	3,586	2,241	1,395	1,763	2,300	1,837
1850	2,192	2,662	6,287	3,832	5,280	1,395	1,757	2,300	1,873
1860	2,171	2,643	6,342	4,152	4,729	1,395	1,752	2,300	1,932
1870	2,090	2,610	5,654	2,514	6,143	1,395	1,746	2,300	1,900
1880	2,073	2,542	6,082	1,568	8,105	1,395	1,742	2,300	1,913
1890	2,029	2,443	6,633	1,315	8,266	1,419	1,738	2,313	1,963
1900	2,000	2,343	6,328	1,686	9,568	1,610	1,734	1,970	2,061
1910	2,056	2,346	5,961	3,029	10,131	1,757	1,730	2,038	2,225
1920	1,964	2,400	5,335	3,042	9,519	2,062	1,689	1,793	2,342
1930	1,742	2,234	3,341	3,109	6,088	2,108	1,754	1,791	2,193
1940	1,616	1,990	2,425	2,781	5,137	1,991	2,590	1,181	1,976
1950	1,353	1,761	1,125	1,927	2,752	2,291	2,572	1,552	1,962
1960	1,012	1,445	372	1,702	1,309	2,462	2,472	1,436	1,905
1970	542	1,098	196	1,136	718	1,971	1,979	1,195	1,495
1980	224	915	126	799	674	1,480	1,599	949	1,138
1990	114	981	85	541	455	1,276	1,027	834	982
2000	75	992	60	495	285	1,049	786	662	820
2010	39	680	43	319	275	883	630	634	680
2020	0	411	31	247	40	781	551	552	584

Note: the figures refer to the kcal apportioned to humans from the exploitation of working animals: total fodder consumed by working animals per day/humans.

Sources: see text.

Africa: working animals still play an important role in African agriculture (*Animal Traction in Rainfed Agriculture in Africa and South America* (1991), Starkey (2000), Ehui, Poison (1993)). In 1975 the ratio horse equivalents-population was 0.04 (Alexandratos, Bruinsma, Hrabovszky (1982), pp. 148-50), despite the presence of trypanosomiasis which constrained livestock breeding (Gifford (1981), p. 17). In Mitchell (2013), livestock is recorded per race for several African coun-

tries. My series is computed from data relating to the following countries: Algeria (1860-2010), Egypt (1913-2010), Ethiopia-Eritrea (1938-2010), Nigeria (1945-2010), South Africa (1849-2010). For the first half of the nineteenth century and the years 2010-16, I assumed the same ratio horse equivalents-population respectively of 1850 and 2010. Useful for comparisons with my data are: Alexandratos, Bruinsma, Hrabovszky (1982), pp. 148-50 (20 African countries in 1975); Biswanger, Donovan (1987), p. 71 (Senegal 1959-75).

The results of my calculations for the macroareas are summarised in Table 12.

A comparison of estimates of traditional energy sources

Victor Court (2016), pp. 216-24) worked out different estimates of traditional sources over the last two centuries. His long-term trend of energy consumption will be compared to mine in the next section 5. Here a comparison is presented concerning traditional sources of energy. The purpose of Court's reconstruction is the elaboration of a global series of energy production; which, however, on a world scale, coincides with production. Court does not provide series per macroareas, but on the world scale. In particular, "regarding traditional biomass energy (woodfuel and crop residues), I averaged data from Fernandes et al. (2007) and Smil (2010). Primary fossil fuels time series were retrieved from The Shift Project (2015), which is built on the original work of Etemad & Luciani (1991) for the 1900–1980 time period and EIA (2014) for 1981–2010" (p. 216). As we see, Court exploits some of the sources I exploited as well.

In Table 13 the differences between the databases by Court and the present one have been compared through an estimation of kcal per capita per day in five different years. The series of population are those of our Table A.1. We see in col. 1, 4 and 7 that the differences in food consumption are modest; although stability over the the last two centuries seems implausible. A remarkable diversity exists between the series of fuelwood consumption. In the series by Court the average daily consumption in 1820 is in the order of four kg, while in the present series is about two kg. Although decreasing in time, the difference exists at the end of our series as well. The contribution of the working animals to total consumption is higher in our series than in that by Court. In particular, my series does not diminish so fast in the 20th century. Although a decline is certain, draft animals play still a non negligible role in many developing countries, such as previously shown. As we will see in section 5, the difference between the estimates of modern sources is negligible.

Table 13. Different estimates in Kcal per capita per day of traditional sources of energy on the World scale 1820-2000

Kcal per capita per day									
	Court			Malanima			Malanima/Court		
	1	2	3	4	5	6	7	8	9
	Food	Fuelwood	Fodder	Food	Fuelwood	Fodder	Food	Fuelwood	Fodder
1820	2,450	12,972	1,571	2,241	5,487	1,776	0.91	0.42	1.13
1850	2,199	11,862	1,236	2,273	6,077	1,873	1.03	0.51	1.52
1900	2,136	9,112	962	2,381	5,461	2,061	1.11	0.60	2.14
1950	2,496	6,858	220	2,412	4,400	1,962	0.97	0.64	8.93
2000	2,493	4,750	66	2,839	2,822	820	1.14	0.59	12.38

Sources: Court (2016) and present text.

4. Modern sources

Following the chronology of their exploitation, modern primary sources of energy are coal, oil, natural gas, primary electricity, nuclear and biofuels. Peat is ordinarily included in "coal" or "solid fuels" (adjusted on the basis of its caloric content -2,600 kcal/kg-: Etemad, Luciani (1991), p. XXVII, Darmstadter (1971), p. 819). Although the statistical data on consumption of modern sources of energy is much wider and reliable than on pre-modern sources, considerable differences among the available databases exist. Assumptions about the energy content of fossil fuels are dif-

ferent and can result in a range of uncertainty of about 10 percent. In the case of primary electricity the uncertainty is much wider (such as stated by Newell, Raimi 2020).

The series refer always to consumption. Included in my series is the energy used within a nation's borders directly. I actually adopt what is ordinarily called the Production Based Accounting (PBA) and not the Consumption Based Accounting (CBA), which also takes the indirect energy into account that was required to produce traded goods that were eventually consumed in another country. Prior to 1965, the available databases of energy ordinarily deal with production. Only from 1965 onwards can we avail of databases of yearly consumption by source for several countries in the World. For the previous period a calculation of consumption (both per macroarea and nation) meets several difficulties. In any case, we can never assume production as a proxy for consumption (with the obvious exception of the World on the whole) (such as shown by Kander, Warde, Teives Henriques, Nielsen, Kulionis, Hagen (2017)). Since the start of the exploitation of modern sources, wide scale trading of coal and oil began (the problem is discussed for LA in Rubio, Yáñez, Folchi, Carreras (2010); for UK, see Harley 1989)). As a consequence, both for any nation and any macroarea, production and consumption did not coincide, apart from natural gas and hydroelectricity, whereby before 1965 production often coincided with consumption, since the trade of these carriers developed relatively late (Table 14). On the differences production-consumption see UN (1952).

Table 14. Ratio production to consumption per macroarea for Coal, Oil, Gas and Hydroelectricity 1925, 1950, 1965

	WE	EE	NA	LA	O	As	ME	Af
COAL								
1925	1.063	1.128	1.018	0.659	1.103	1.094	0.991	1.045
1950	0.998	1.034	1.008	0.961	0.980	1.006	0.991	1.056
1965	0.918	1.031	1.069	0.925	1.222	0.873	0.996	1.010
OIL								
1925	0.033	1.256	1.143	3.732	-	1.118	4.292	0.236
1950	0.076	0.986	0.908	5.727	-	1.038	13.912	0.300
1965	0.060	1.231	0.798	4.204	0.018	0.294	14.940	4.413
GAS								
1925	1.000	1.000	1.000	0.991	-	1.000	-	-
1950	0.963	0.996	1.004	0.837	-	1.000	1.000	-
1965	0.961	1.000	0.997	1.059	1.000	1.007	1.000	1.760
HYDRO								
1925	0.998	0.883	1.000	1.000	1.000	1.000	1.000	1.000
1950	0.996	1.015	1.004	0.967	1.000	1.000	1.000	1.000
1965	0.999	1.000	0.997	0.996	1.000	1.000	1.000	1.001

Source: Darmstadter (1971).

The estimates of energy consumption per macro-area are based on national series for 72 countries (reported in the *Database*). These estimates refer to the so-called “apparent consumption”. “Apparent” means that for any source and for any country consumption is the result of production plus imports minus exports. “Inventory accumulation or depletion, which may make an area’s actual consumption lower or higher than tabulated, is ignored” (Darmstadter (1971), p. 3).

In order to build the series, I employed two distinct methods, one for traditional sources and another for modern sources. My series of consumption of traditional sources started from estimates of consumption per capita, which were then multiplied by the population in order to reach aggregate figures; whereas, for the estimation of modern sources I started from aggregate values for any nation, then divided them by the population in order to compute per capita values. **For any macroarea consumption is the sum of the yearly series of each source.**

In any case, such as for traditional primary sources, present series refer to the input of a source of energy into engines (both biological and mechanical). Then, for instance, at the beginning of the nineteenth century, the efficiency of a steam engine fuelled by coal was about 1 percent. The present series do not refer to this 1 percent, but to 100 percent put into the steam engine. As shown previously, the same procedure is followed for the estimates of traditional sources: the input of food is computed and not the engendered mechanical work (more or less equal to 15 percent of the input). In order to follow this same method of calculation, primary electricity deserves special attention. Electricity is never a primary source. Primary sources are coal, oil, natural gas, falling water, wind, solar heat, biomass or nuclear and bio fuels exploited to generate electricity in power stations. Following a common usage, I use the label of *Primary Electricity* whenever electricity is produced through falling water, wind, and Sun's heat. In the present database, as ordinarily done, coal, oil and natural gas exploited in power stations for the production of electricity, are included in the series of coal, oil and natural gas (and not in those of *Primary Electricity*). The same holds true for nuclear energy and biofuels. Following the logic of this method of calculation, the electricity produced by anything other than coal, oil and gas would have to be computed as the force of falling water, that of the wind, of the Sun's heat and of nuclear and bio fuels. In order to compute the input of energy employed for the production of electricity, the procedure is the following. If, for instance, a country exploits the energy in its power stations with the efficiency (that is the ratio between the output and input into its turbines) of 0.30, and this generated energy is equal to 50 Mtoe, then we divide 50 by 0.30 and the result (166) is the actual input of energy. This calculation, however, is not followed in the available series of primary electricity and nuclear electricity.

Two frequent methods used in the available estimates of electricity consumption are:

1. to take into account only the generated electricity (then the item *Primary Electricity* includes the electricity consumed by final consumers and not the energy input of a carrier into the power station). Then, if, for instance, the yield in the production of electricity in a power station, is 30 percent, the value we find in the series is not the input, but only the output (the 30 percent of total input);

2. to convert the generated electricity into the input of energy as any power station were fuelled through fossil fuels. Assuming that the electricity produced in a country is 2000 and that the average yield by the power stations of that country fuelled with coal is 30 percent, the resulting electricity is $2,000/0.30 = 6,666$; even though in that country all electricity is produced through the falling water (whose yield is about 90 percent and not 30 percent).

In the first case the result is an underestimate of the value of the consumption of primary energy. In the second case the result is an underestimate for hydroelectricity and an overestimate for solar and wind electricity (Newell, Raimi (2020), p. 10). For example: in the database *BP Statistical Review of World Energy 2019*, we read in the sheet *Definitions*: "The primary energy values of nuclear and hydroelectric generation, as well as electricity from renewable sources, have been derived by calculating the equivalent amount of fossil fuel required to generate the same volume of electricity in a thermal power station, assuming a conversion efficiency of 38 percent". The procedure followed in the BP series of the electricity generated in power stations is to take the output of electricity and to divide it by 0.38 in order to estimate the input of primary energy (the equivalent amount of fossil fuel). Then, if on the World scale the energy generated (through fossil fuels, water, wind...) is 10,000, this amount is divided in any case by 0.38 (the yield of the fossil fuelled power stations) and the result (that is the output) is 23,616.

The method to estimate "primary electricity" in the present series is different; the energy input was calculated by dividing the energy generated in the power station by the actual yield of the power station. Following Eurelectric (2003), I used as coefficients of conversion (that is the efficiency of the turbines): 1. for hydro turbines 0.90; 2. for renewables (solar and wind electricity) 0.25; and 3. for nuclear 0.30. In specific cases, the conversion of the already existing series into new homogeneous series by always following the previous procedure implies a recalculation. As an example, I take the case of the BP database, which I frequently followed in my series of modern sources since 1965. In that case BP estimated primary energy assuming the standard coefficient of 0.38 for any power station. Following my own procedure, I multiplied the BP series by 0.38 (in order to estimate the generated electricity) and then divided the result by 0.90 in the case of hydroelectricity, by 0.25 in the case of other renewables and by 0.30 in that of nuclear electricity. Notice that in the specific case of hydroelectricity a calculation of the generated electricity and that of the input of falling water into the power station results in relatively similar figures (given the high yield of the hydro turbines). It is not so in the case of nuclear or wind or solar fuelled power stations.

On the harmonization of different series in international databases see in particular Newell, Raimi (2020).

Primary Electricity is equal to the sum of *Hydro* and *Other Renewables*.

Even though not always specified in the following information per macro-area and country, brown coal, when distinguished from hard coal in the sources of data, is computed with a heating content equal to 0.5 hard coal.

For the national statistical reconstructions of modern carriers of energy some more exploited sources of information are (in brackets the acronym or name used in the following explanatory notes):

(EL) Etemad, B., Luciani, J. (1991) (series of production per country and macro-area 1800-1985).

(SPDP) *Shift Project Data Portal* (tabulated data from EL and EIA starting from 1900).

(EIA US) *EIA Historical Statistics for 1980-2013* (<http://www.tsp-data-portal.org/all-datasets>).

(EIA-DOE) *Coal_consumption_by_country 1980-2012* (www.Eia-Doe).

(EIA 2021) *International Data World* (<https://www.eia.gov/international/data/world>)

(ENERDATA) *ENERDATA. Global Energy Statistical Yearbook 2019*.

(ENERDATA) *ENERDATA. Global Energy Statistical Yearbook 2020*.

(ENERDATA) *ENERDATA. Global Energy Statistical Yearbook 2021*.

(Mitchell 1998a) Mitchell, B.R. (1998a). *International Historical Statistics. Africa, Asia & Oceania 1750-1993*. London, McMillan (series on production, exports and imports); data on production pp. 352-72 and on export-import pp. 653-67.

(Mitchell 1998b) Mitchell, B.R. (1998b). *International Historical Statistics. Europe 1750-1993*. London, McMillan (series on production, exports and imports); data on production pp. 426-41 and on export-import pp. 476-98;

(Mitchell 1983) Mitchell, B.R. (1983). *International Historical Statistics. The Americas and Australasia*. London, McMillan (series on production, exports and imports); data on production on pp. 399-413 and on export-import on pp. 522-32.

(Mitchell 2013) Mitchell, B.R. (2013). *International Historical Statistics*. London, Palgrave (series on production, exports and imports updated to 2010).

(Darmstadter 1971) Darmstadter, J. (with Polach, J.G., Teitelbaum, P.D.) (1971). *Energy in the World economy. A Statistical Review of Trends in Output, Trade, and Consumption since 1925*. Baltimore, John Hopkins Press (series on production, import-export and consumption for the years 1925, 1929, 1933, 1937, 1938, 1950, 1953, 1955, 1957 and 1960-65).

(BP) *BP Statistical Review of World Energy (June 2017, June 2018, June 2019, June 2020, June 2021)* (data per source for 72 countries since 1965).

(WDI) *World Development Indicators*, 2018 (only used for primary electricity: in the dataset Hydro, Renewables and Nuclear are specified and allow to compute primary electricity following the method explained above).

(WDI) *World Development Indicators*, 2019.

(WDI) *World Development Indicators*, 2020.

(WDI) *World Development Indicators*, 2021.

(IEA 2018). *Energy balances of OECD countries, Energy balances of non-OECD countries*.

(IEA 2020). *World Energy Balances Highlights (2020)*.

Energy History Joint Center for History and Economics. Series of data on energy consumption (including traditional sources).

(OPEC 2020) *Opec World Oil Demand* (in https://asb.opec.org/data/ASB_Data.php).

(CEPAL) *CEPAL-CEPALSTAT, Estadísticas e indicadores ambientales, Producción y consumo de energía de recursos renovables y no renovables*.

(EU) *EUROSTAT, Complete Energy Balances [nrg_bal_c]*
(<https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>)

(CIA 1979). *Energy Supplies in Eastern Europe: A Statistical Compilation*. Central Intelligence Agency, Washington D.C. (database for Bulgaria, Czechoslovakia, Hungary, Poland, Romania for the years 1960-77). I converted data in barrels per day: 1 barrel/day equal to 0.0000498 MTOE/year.

AEIS (Africa Energy Information System) AEIS: <https://au-afrec.org/en/energy-browser>

Whenever the source of recent data (from 2010) is not specified, I took the data from the two volumes by ENI (2017), *World Oil Review 2017, I, World Gas and Renewables Review 2017, II*; ENI (2019), *World oil review 2019, I, World Gas and Renewables Review 2019, II*; ENI (2021), *World Energy Review 2021*.

Western Europe

Austria: Coal from Gross (1971)(where Brown Coal, or lignite, is equal to 0.5 Hard Coal) until 1913 (data refers to Cisleithania). Retropolation from 1831 until 1820. Austrian population, within present borders, was equal to 25 percent (Mitchell 1998b and Findl, Helczmanovszki (1974), p. 20) of Cisleithanian population. Data from Gross have been adjusted on the basis of relative population. The period 1925-65 is from Darmstadter (1971), 1966-2018 from BP. *Oil* data on oil import and export from 1864 in Mitchell 1998b are not plausible in the light of the series in Darmstadter (1971) from 1925 (probably oils different from petroleum are also included); then I take the figure on imports from Mitchell (1998b) and interpolate the figures of oil from 1864 until 1925; Darmstadter (1971) for 1925-65; BP from 1966. Only few data are added by Kreuzberger (1961). *Gas* consumption (equal to production) starts in 1946 and is from EL until 1964, then BP. *Hydro* from 1918 until 1964 is from EL and SPDP, then from BP. *Other Renewables* BP from 1986. *Biofuels* BP.

Belgium: Coal apparent consumption 1831-1964 from Mitchell (1998b) and retropolation for 1820-30; from 1965 from BP; Michotte (1929). *Oil* computed as Import-Export (no domestic production) from Mitchell (1998b); Darmstadter (1971) 1925-64; BP from 1965. *Gas* consumption starts in 1950; for 1950-64 Darmstadter (1971); from 1965 BP. *Hydro* for 1920 from EL, Darmstadter (1971) for 1925-60 and EL 1960-64; BP from 1965. *Other Renewables* BP from 1973. *Nuclear* from 1966 BP. *Biofuels* BP.

Denmark: Coal together with peat (2,600 kcal/kg) from Teives Henriques, Sharp (2016, Online Supporting Information) until 1904; from 1905 Mitchell (1998b) import plus production; BP from 1965. *Oil* import from Mitchell (1998b) since 1863; BP from 1965. *Gas* starts from 1984 BP. *Hydro* EL from 1939; BP from 1965. *Other Renewables* from 1978 BP. A comparison is possible with the series (per decade and 5 years from 1820-1910 and annual 1910-13) by Teives Henriques, Sharp (2016, Online Supporting Information). The correlation is 0.999. *Biofuels* EIA.

Finland: Coal only import (no production) from 1860 Mitchell (1998b); BP from 1970; *Oil* only import from 1865 Mitchell (1998b); BP from 1965. *Gas* consumption starts from 1974, BP. *Hydro* EL 1929-59, Darmstadter (1971) 1960-64; BP from 1964. *Other Renewables* from 1990 BP. *Nuclear* from 1977 BP. *Biofuels* BP.

France: Coal from *Energy History* (series elaborated by Ben Gales) with new series for primary electricity; *Hydro* from 1923 EL and BP from 1965. *Other Renewables* BP from 1966. *Nuclear* from 1958 EL, from 1965 BP. Data for coal, oil, gas from 2000 are from BP. *Biofuels* BP.

Germany: Coal from *Energy History* (series elaborated by Paul Warde). BP from 2009 for *Coal* and *Gas*, *IEA Headline Global Energy Data (2017 edition.)* For *Oil* from 2002 *ENERDATA. Global Energy Statistical Yearbook 2019*. *Nuclear* from EL for 1961-64 and BP from 1965. *Biofuels* BP.

Greece: Coal production from 1900-15 from EL and 1916-64 from Mitchell (1998b), import 1867-1964 from Mitchell (1998b); from 1965 BP. *Oil* 1925-64 from Mitchell (1998b) (only import), BP from 1965. *Gas* consumption starts from 1982 (Mitchell (1998b)). *Hydro* 1928-64 from EL (production equal to consumption). *Other Renewables* from 1988 BP. *Biofuels* EIA.

Ireland: the country was part of the UK from 1801 until 1921. For these 120 years it is hard to distinguish Irish consumption of coal and oil from that consumed in UK. *Coal* production is from EL from 1830 (data on production in 1855, 1873, 1893, 1907 also in Bielenberg (2014), p. 198). Importations are from EPPI, Enhanced British Parliamentary Papers on Ireland (www.dippam.ac.uk) for the years 1820-22, 1824-27, 1846-47 and 1864 (interpolated the missing years). Data on peat consumption (2,600 kcal/kg) are from Kennedy (2013, p. 27), with interpolations for the missing years. *Oil* retropolation to 1880 from 1925 with the rates of growth 1925-30 (Darmstadter (1971)); 1925-64 Darmstadter (1971); BP from 1965. *Gas* from 1979 BP; *Hydro* EL from 1930. *Other Renewables* from 1992 BP. *Biofuels* EIA.

Italy: from Malanima (2006 and 2013). BP from 1965 for *Hydro*, *Other Renewables* and *Nuclear* and BP for coal, oil and gas from 2010. *Biofuels* BP. See also Bartoletto, del Mar Rubio Varas (2008), and Bartoletto (2013).

Netherlands: from *Energy History* (series elaborated by Ben Gales). The series have been completed for oil with ENERDATA. *Global Energy Statistical Yearbook 2019* from 1990 and BP for *Hydro Other Renewables*. On gas see also Gales, B. (2013). *Biofuels* BP.

Norway: *Coal* import (from 1929) plus production (Mitchell (1998b)); BP from 1970. *Oil* Mitchell (1998b) from 1863 and BP from 1965. *Gas* from 1978 BP. *Hydro* 1935 EL and BP from 1965. *Other Renewables* BP from 1985. A useful comparison has been done with the series by Lindmark, Minde, 'Et energiregnskap for Fastlands-Norge 1835–2012', *Heimen* (2018), pp. 157-77. *Biofuels* EIA.

Portugal: Teives Henriques (2009 and 2011). Data retropolated for 1820-50 (when the series by Teives Henriques start). Completed with BP from 2009. *Oil* 2011-18 from ENERDATA. *Global Energy Statistical Yearbook 2019*. *Biofuels* BP.

Spain: from *Energy History* (series elaborated by Mar Rubio. See the criteria followed in Rubio (2005)); see also Bartoletto, del Mar Rubio Varas (2008). Retropolation from 1850 until 1820. From 2009 completed with BP. For oil from 2012 ENERDATA. *Global Energy Statistical Yearbook 2019*. *Biofuels* BP.

Sweden: Kander (2002). Series completed with BP from 2000 and Electricity revised (according to the just recalled procedure for primary electricity). *Oil* from 2005 ENERDATA. *Global Energy Statistical Yearbook 2019*. *Biofuels* BP.

Switzerland: *Coal* import from 1858 until 1924 (Mitchell (1998b)), Darmstadter from 1925 until 1964, BP from 1965. *Oil* only importation from 1870 until 1964 (Mitchell (1998b)), BP from 1965. *Gas* from 1971 BP. *Hydro* EL 1929-64; BP from 1965. *Other Renewables* BP from 1978. *Nuclear* BP from 1969. *Biofuels* EIA.

United Kingdom: *Coal* production minus export (Mitchell (1998b)) from 1820 until 1991; BP from 1991. A series of coal consumption has also been built by the Department for Business, Energy and Industrial Strategy, Historical Coal Data: Coal Availability and Consumption, 1853 to 2017 (www.gov.uk). The correlation between this series and my series of coal is 0.992 (and the correlation of my series with that by Warde (2007) is 0.990). *Oil* from 1856 production + crude oil imports + refined oil import - export - Irish consumption in 1820-1921 (Mitchell (1998b)); BP from 1977. *Gas* Mitchell (1998b) 1930-39; EL 1950-77; BP dal 1978. *Hydro* EL 1920-64; BP from 1965. *Other Renewables* BP from 1984. *Nuclear* from 1956 Bolton (2013), p. 11 and BP. *Biofuels* BP.

Eastern Europe

Bulgaria: *Coal* from Mitchell (1998b) production from 1894 (brown coal 0.5 hard coal) plus import (from 1887), and from 1980 from BP. *Oil* EL for production, Mitchell (1998b) for import, and BP from 1965. *Gas* from 1965, BP series. *Hydro* EL from 1929 and BP from 1965. *Other Renewables* BP from 2010. *Nuclear* BP from 1974. *Biofuels* EIA.

Czechoslovakia: All data from 1820 until 1917 refer to Bohemia and Moravia, from 1919 until 1991 to Czechoslovakia, and from 1992 until 2003 to Czechia plus Slovakia. All data are from *Kuskova et al. Energy Consumption in Czechoslovakia*. For a comparison of this series with those of Germany and Britain, see Nielsen, Warde, Kander (2017). *Biofuels* EIA.

Hungary: *Coal* data in the series 1851-1914 in Gross (1971) are too high. I used Mitchell (1998b) from 1851 for production (brown coal 0.5 hard coal) and for import-export; data on consump-

tion 1960-69 from CIA (1979) and, from 1970, BP. *Oil* from 1900 production in EL and import-export in Mitchell (1998b); BP from 1968. *Hydro* EL from 1946 and BP from 1965. *Other Renewables* from BP since 1995. *Nuclear* from 1982 BP. *Biofuels* EIA.

Poland: *Coal* data EL from 1820; import and export start from 1920 (Mitchell 1998b); CIA (1979) 1960-69; BP from 1970. *Oil* production EL from 1874 and import-export Mitchell (1998b) from 1920; BP from 1965. *Gas* EL 1922. From 1950 Poland is no longer independent (Darmstadter 1971). BP from 1965. *Hydro* EL from 1927; BP from 1965. *Other Renewables* BP from 1969. *Biofuels* BP.

Romania: *Coal* from 1882 (Mitchell 1998b) production (brown and hard coal) plus import; BP rates of growth from 1974. *Oil* production Mitchell (1998b) in 1883-1900, EL from 1900 and export from Mitchell; from 1965 BP. *Gas* production from 1922 from Mitchell (1998b); export starts from 1960 (Darmstadter 1971); BP from 1965. *Hydro* EL from 1924; BP from 1965. *Other Renewables* from 2010 BP. *Nuclear* from 1996 BP. *Biofuels* EIA.

USSR: after 1990, the series is the result of the sum of data for: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan. *Coal* from 1830 EL (production = consumption); from 1866 import and export from Mitchell (1998b); from 1965 BP. *Oil* production from 1860 EL and import-export from Mitchell (1998b); BP from 1965. *Gas* from 1922 EL and from 1965 BP. *Hydro* from 1921 EL; from 1965 BP. *Other Renewables* from 1998 BP. *Nuclear* from 1965 BP. Our data on coal and oil production coincide with those by Suhara (2017). *Biofuels* EIA.

Yugoslavia: after 1992, the series is the result of the sum of data for: Bosnia and Herzegovina, Croatia, Montenegro, Serbia, Slovenia, TFYR Macedonia. Data from 1990 for the former Yugoslavia are still uncertain. Comparisons have been done with data per source in BP database 2021 and IEA series and ENI (2021) and the useful IEA (2008). *Coal* data on Serbia from 1893 in Mitchell (1998b) on production (brown and hard coal), export and import (until 1912 data on apparent consumption are divided by 0.4 in order to compute an estimate of Yugoslavia, since in Serbia lived 40 percent of Yugoslavian population) see also Republic of Serbia (2016); from 1965 BP. *Oil* from 1922 import from Mitchell (1998b), production EL from 1933 and BP from 1980. *Gas* from 1926 EL and Bartoletto (2016), p. 24 from 1990 (sum of Slovenia, Bosnia, Erzegovina, Croatia, Serbia, Macedonia, Montenegro). *Hydro* EL from 1929, BP from 1992. *Nuclear* BP from 1981. *Biofuels* EIA.

North America

Canada: the series of modern carriers are those of Unger, Thistle (2013), updated with BP from 1998 (*Oil* from 2000: *ENERDATA. Global Energy Statistical Yearbook 2018*). *Primary electricity* is from BP since 1965. *Biofuels* BP.

USA: the series are those of O'Connor, Cleveland (2014) and O'Connor (w.d.) updated from 2010 with *EIA Annual Energy Review February 2021* in www.eia.gov/totalenergy/data/annual/. The complete series of electricity is from *EIA*. See also: Netschert, Schurr (1960), pp. 47 and 86 and Linde (1991), p. 51. *Oil* since 1949 is from *EIA Energy Perspective Figures (Table 5)*. *Biofuels* EIA 1981-90; then BP. The correlation between the *EIA Energy Perspective Figures (Table 5)* and our series from 1949 to 2011 is 0.999.

Latin America

For Latin America Mar Del Mar Rubio allowed to compare mine to her complete series (not yet published) of total consumption of modern sources for 20 Latin American countries in 1856-2000 (I thank Mar for her kindness). In my series of coal and hydroelectricity I followed respectively Yáñez, Rubio, Jofré, Carreras (2013) and Rubio, Tafunell (2014). The other series were independently developed. In Table 15, I report the correlation among my series and those by Rubio. The coefficient of correlation is ordinarily close to 0.99. Only in the case of Panama it is lower.

The book by Wu (1995) mainly deals with 1980-95 and adds little to our statistical sources. Series covering 1970-2017 have been produced by (CEPAL), although not complete for any source. In the present database, CEPAL series have been used to cover some series for the years after 2010 and to check our data. For Coal I exploited also (EIA-DOE). For Oil, Gas and renewables (in Electricity) series have been completed for 2017-18 with EIA (2021) and ENI (2019).

Table 15. Correlation between the present series of modern sources for Latin America and those by Mar Del Mar Rubio 1856-2000

1	Argentina	0.996	11	Guatemala	0.994
2	Bolivia	0.988	12	Haiti	0.968
3	Brasil	0.999	13	Honduras	0.991
4	Chile	0.998	14	Mexico	0.998
5	Colombia	0.995	15	Nicaragua	0.984
6	Costa Rica	0.994	16	Panama	0.954
7	Cuba	0.990	17	Paraguay	0.983
8	Dominican R.	0.971	18	Peru	0.985
9	Ecuador	0.990	19	Uruguay	0.994
10	El Salvador	0.991	20	Venezuela	0.992

Source: see text.

For the period 1980-2019, I exploited also EIA (2021) for all Latin American countries.

Argentina: Coal Yáñez, Rubio, Jofré, Carreras (2013), from 1856, updated with BP from 1997. *Oil* UN (1957). *Energy in America Latina*, p. 134, 1925-55, Darmstadter (1971) 1955-65, BP from 1965. *Gas* EL from 1922, BP from 1965. *Hydro* Rubio, Tafunell (2014) from 1907; BP from 1965. *Other Renewables* BP from 1970. *Nuclear* BP from 1974. *Biofuels* BP.

Bolivia: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1915, updated with BP from 1997. *Oil* Darmstadter (1971) 1925-65, interpolated from 1965 to 1980, SPDP (from EIA) from 1980. *Gas* 1955-79 Mitchell (1983), SPDP (form EIA) from 1980. *Hydro* Rubio, Tafunell (2014) 1915-70; WDI from 1971. *Other Renewables* WDI from 1971. *Biofuels* EIA.

Brazil: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1856, updated with BP from 1996. *Oil* from 1903 production plus import from Mitchell (1983); BP from 1966. *Gas* Mitchell (1983) for 1940-45, SPDP for 1946-65, BP from 1966. *Hydro* Rubio, Tafunell (2014) for 1890-1964; BP from 1965. *Other Renewables* BP from 1970. *Nuclear* BP from 1974. *Biofuels* Ministry of Mines and Energy EPE (2007) for 1970; interpolation in 1971-79; EIA 1980-89; BP after 1990.

Chile: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1856; BP from 1996. *Oil* 1925-49 UN (1957). *Energy in America Latina*, pp. 149-50, 1950-64 Darmstadter (1971), BP from 1965. *Gas* EL (SPDP) 1949-51, Mitchell (1983) 1952-80, BP from 1981. *Hydro* Rubio, Tafunell (2014) from 1897; BP from 1965. *Other Renewables* from 1983 BP.

Colombia: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1856, updated with BP from 2000. *Oil* production minus export from 1922 Mitchell (1983), BP from 1971. *Gas* Mitchell (1983) from 1935, BP from 1966. *Hydro* Rubio, Tafunell (2014) from 1907; BP from 1965. *Other Renewables* BP from 1975. *Biofuels* BP.

Costa Rica: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1870 until 1951. *Oil* from 1872 UN (1957). *Energy in America Latina*, p. 172 from 1925, interpolation 1925-79, SPDP (form EIA) from 1980, ENI (2017) 2013-16. *Hydro* Rubio, Tafunell (2014) from 1900; WDI from 1971. *Other Renewables* WDI from 1971. *Biofuels* EIA.

Cuba: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1856 (for 1841-50 import from Mitchell (1983) assuming that consumption is 30 percent higher than importation, such as in 1856), SPDP (form EIA) from 2000. *Oil* Darmstadter (1971) 1925-65, interpolation 1965-79, SPDP (form EIA) from 1980. *Gas* SPDP (from EIA) from 1980. *Hydro* Rubio, Tafunell (2014) from 1907; WDI from 1971. *Other Renewables* WDI from 1971. *Biofuels* EIA.

Dominican Republic: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1870, SPDP (from EIA) from 1982. *Oil* 1937-53 UN (1957) p. 177, interpolation 1954-79, SPDP (from EIA) from 1980. *Gas* SPDP (from EIA) from 2003. *Hydro* Rubio, Tafunell (2014) from 1952, WDI from 1971. *Other Renewables* WDI from 1971. *Biofuels* EIA.

Ecuador: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1892. *Oil* EL 1917-24, Darmstadter (1971) 1925-65, BP from 1966. *Gas* EL 1917-24, Darmstadter (1971) 1933-38, EL 1939-49, Darmstadter (1971) 1950-64, BP 1965. *Hydro* Rubio, Tafunell (2014) 1910-70, WDI from 1971. *Other Renewables* BP from 2006. *Biofuels* EIA.

El Salvador: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1870, SPDP (from EIA) from 1980. *Oil UN* (1957) 1925-54, interpolation 1955-79, SPDP (from EIA) from 1980. *Gas* no gas consumption. *Hydro* Rubio, Tafunell (2014) from 1912, WDI from 1971. *Other Renewables* WDI from 1975. *Biofuels* EIA.

Guatemala: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1870, SPDP (from EIA) from 1980. *Oil UN* (1957) 1925-54, interpolation 1955-79, SPDP (from EIA) from 1980. *Gas* no gas consumption. *Hydro* Rubio, Tafunell (2014) from 1907, WDI from 1971. *Other Renewables* WDI from 1971.

Haiti: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1970, SPDP (from EIA) 1982-93, no coal consumption later. *Oil UN* (1957), pp. 174-75 1925-54, interpolation 1955-79, SPDP (from EIA) from 1980. *Gas* no gas consumption *Hydro* WDI from 1971. *Other Renewables* WDI from 1971 and until 1991.

Honduras: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1870, SPDP (from EIA) from 1981. *Oil UN* (1957), p. 175 1925-54, interpolation 1955-79, SPDP (from EIA) from 1980. *Gas* no gas consumption. *Hydro* Rubio, Tafunell (2014) from 1908, WDI from 1971. *Other Renewables* WDI from 1999.

Mexico: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1856, updated with BP from 2001. *Oil* 1901-64 Mitchell (1983), BP from 1965. *Gas* Darmstadter (1971) 1925-30, Mitchell (1983) 1932-65, BP from 1965. *Hydro* Rubio, Tafunell (2014) from 1907; WDI from 2001. *Other Renewables* BP from 1973. *Nuclear* BP from 1989. *Biofuels* BP.

Nicaragua: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1871; consumption stops in 1955 and starts again in 2002; from 2002 SPDP (from EIA). *Oil UN* (1957) 1925-54, p. 176, interpolation 1955-79, SPDP (from EIA) from 1980. *Gas* no gas consumption. *Hydro* Rubio, Tafunell (2014) from 1944. *Other Renewables* WDI from 1971.

Panama: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1904, from 1980 SPDP (from EIA); *Oil UN* (1957) 1925-54 and 1970-73, p. 176, interpolation 1955-69, SPDP (from EIA) from 1980. *Hydro* Rubio, Tafunell (2014) from 1950, WDI 1978. *Other Renewables* WDI from 1971. *Nuclear* SPDP (from EIA) 1969-76. *Biofuels* EIA.

Paraguay: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1900, SPDP (from EIA) from 2005. *Oil UN* (1957) 1934-49, p. 177, Darmstadter (1971) 1950-65 interpolated 1966-79, SPDP (from EIA) from 1980. *Gas* no gas consumption. *Hydro* Rubio, Tafunell (2014) from 1968, WDI from 1982. *Other Renewables* WDI from 1981. *Biofuels* EIA.

Peru: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1856, BP from 1980. *Oil* EL from 1881 until 1914, Mitchell (1983) production minus export from 1915, BP from 1979. *Gas* Darmstadter (1971) from 1925, Mitchell (1983) from 1950, BP from 1970. *Hydro* Rubio, Tafunell (2014) from 1907; BP from 1996. *Other Renewables* BP from 1971. *Biofuels* EIA.

Uruguay: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1856, updated with BP from 1997. SPDP (from EIA) from 1980. *Oil* Bertoni, *Energy consumption in Uruguay in: cienciassociales.edu.uy/wp-content/.../Energía-Uruguay.xlsx* 1882-2000, SPDP (from EIA) from 2001. *Gas* Bertoni, *Energy consumption in Uruguay* 1998-2000, SPDP (from EIA) from 2001. *Hydro* Rubio, Tafunell (2014) from 1944, WDI from 1979. *Other Renewables* WDI from 1971. *Biofuels* EIA.

Venezuela: Coal Yáñez, Rubio, Jofré, Carreras (2013) from 1870, BP from 2006. *Oil* Mitchell (1983) from 1884, UN (1957) 1938-48, Mitchell (1983) from 1949, BP from 1970. *Gas* Mitchell (1983) 1932-2003, BP from 2004. *Hydro* Rubio, Tafunell (2014) from 1909; BP from 2000. *Other Renewables* no renewables.

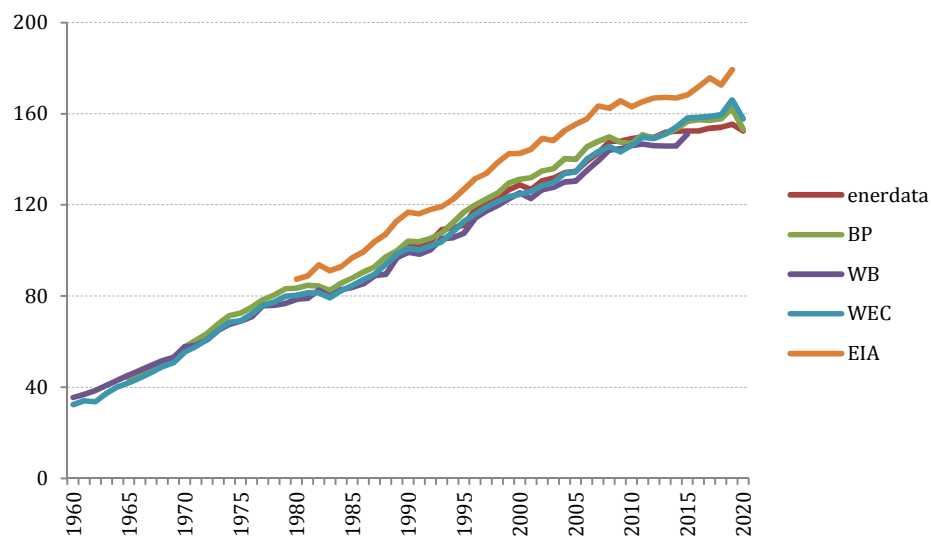
Oceania

Energy consumption in Melanesia, Polinesia, Micronesia, where in 2020 lived about 30 percent of the population of Oceania, is far lower than in Australia and New Zealand. In 1980-2013 it adds 3 percent to the aggregate consumption of modern carriers of Australia plus New Zealand (*Index Mundi*, energy consumption in Australia, New Zealand, Palau, Fiji, Tonga, Samoa, Vanuatu, Solomon Islands, Kiribati). In order to compute total consumption of Oceania I added always 3 percent to total consumption of modern sources by Australia and New Zealand. The series tallies with the series of other databases (Figure 2). Only the estimates in the series by EIA (for Australia plus New Zealand) are remarkably higher.

Australia: Coal was discovered in Australia in 1804, although its commercial exploitation began in 1830 (<http://www.minerals.org.au>). The first data on production starts from 1860 (EL, p. 29). I re-ropolated data for 1830-59. See also the Australian National Bureau of Statistics with data starting from 1881 and coinciding with data by Mitchell (1998a). I assumed that before 1920 brown coal (lignite) was equal to half (with brown coal = 0.5 hard coal, as always in these calculations). Exports start from 1851 (Mitchell (1998a) and are subtracted from production in order to compute consumption. From 1900 production is from SPDP (from EIA). BP from 1965. *Oil* imports from Mitchell (1998a), Darmstadter (1971) from 1925 until 1964, BP from 1965. *Gas* SPDP (from EIA) from 1962, BP from 1966. *Hydro* EL from 1962, BP from 1966. *Other Renewables* BP from 1965. *Biofuels* BP.

New Zealand: Coal from 1878 data from Provider: Ministry of Business, Innovation, and Employment. *Oil* re-ropolation from 1925 to 1901, Darmstadter (1971) from 1925 until 1965, BP from 1965. *Gas* EL from 1960, BP from 1965. *Hydro* EL 1922, BP from 1976. *Other Renewables* EL from 1959, BP from 1965. *Biofuels* BP.

Figure 2. Comparisons of five series of energy consumption relative to Oceania 1960-2020 (Mtoe)



Source: see text.

Asia

China: Coal is hard to quantify prior to 1900. Following Wright (2008), p. 9, I assumed a per capita consumption of coal of 140 kcal per day until 1905. This estimate tallies with the estimate of production per capita provided by Mulhall (1884), p. 89, for the second half of the 19th century. From 1864 we find some information on import and export in Thomson (2003). From 1906 I followed Wright (2008). Data by Thomson (2003) are higher than those by BP (available from 1965), but in line with those by Xiangfei Bai, Hua Ding, Jinjing Lian, Dong Ma, Xiaoyu Yang, Nanxiang Sun, Wenlin Xue & Yijun Chang (2018). The low reliability of data on Coal consumption in China has been criticised (see New York Times, Nov. 3, 2015). Here, however, I follow in BP 2019 the revised series of coal in National Bureau of Statistics of China (<http://data.stats.gov.cn/english/tablequery.htm?code=AA0701>). *Oil* EL from 1926 on production (export only from 1973), BP from 1965. *Gas* EL from 1955, BP from 1965. *Hydro* EL from 1933, BP from 1965. *Other Renewables* BP from 1992. *Nuclear* BP from 1993. *Biofuels* BP.

India: Coal from 1860 EL, from 1890 production from Mitchell (1998a). I assume that –such as in 1925-39- consumption is 75 percent of production, as in Darmstadter (1971), from which I take data 1925-64. BP from 1965. *Oil* from 1879 to 1888 only imports (in gallons; 1 gallon = 0.003147 Toe) from Mitchell (1998a), from 1889 production as well from EL, BP 2019 from 1965. *Gas* production in EL from 1960 is equal to consumption, from 1965 BP. *Hydro* EL from 1929, BP from 1965. *Other Renewables* BP from 1991. *Nuclear* from 1969 BP. *Biofuels* BP.

Indonesia: Coal production from 1890 in Mitchell (1998a). Since in 1925-39 consumption is 75 percent of production, as in Darmstadter (1971), I assume the same percentage previously. From 1925-64 I take data from Darmstadter (1971) and from 1967 from BP. *Oil* production from Mitchell (1998a) from 1893, EL from 1900 (and, from 1910, minus exports of crude and refined), BP from 1967 (ENERDATA 2021 for 2014-20). *Gas* production is equal to consumption from 1921 Mitchell (1998a; 1 cubic metre = 0.0009315 Toe) and BP from 1967. *Hydro* EL from 1928 and BP from 1968. *Other Renewables* BP from 1990. *Biofuels* BP.

Japan: Coal from Mitchell (1998a) production and import from 1868, BP from 1965. *Oil* production, from 1869-1901 and since 1902 from EL, plus import since 1910 of crude and refined (Mitchell 1998a; 1 gallon US = 0.003499 Toe), BP from 1965. *Gas* from 1922 from EL and BP from 1965. *Gas* from 1922 EL and BP from 1970. *Hydro* from 1915 EL and from 1965 BP. *Other Renewables* BP from 1970. *Nuclear* from 1966 BP. *Biofuels* BP.

Malaysia: Coal from 1890 EL data on production. I assume that consumption is higher than production such it was in 1925-30: by about 15 percent. Darmstadter (1971) for 1925-65. From 1977 *Malaysia energy statistics handbook 2015*, p. 41. *Oil* EL 1912-24, Darmstadter (1998a) 1925-65, BP from 1966. *Gas* from 1971 BP. *Hydro* EL from 1928, BP from 1965. *Other Renewables* from 2009 BP. *Biofuels* BP.

Philippines: Coal 1907-24 Mitchell (1998a) on production (assuming that production is 10 percent of consumption such as after 1925), Darmstadter (1971) 1925-1964, BP from 1965. *Oil* Darmstadter (1971a) 1925-65, BP from 1966. *Gas* BP from 2001. *Hydro* EL 1928-74, BP from 1975. *Other Renewables* BP from 1979. *Biofuels* BP.

Thailand: Coal Darmstadter (1971) 1925-65, BP from 1966. *Oil* Darmstadter (1971) 1925-64, BP from 1965. *Gas* BP from 1981. *Hydro* EL 1964-68, BP from 1969. *Other Renewables* BP from 1996. *Nuclear* BP from 1978. *Biofuels* BP.

Middle East

Iran: Coal production is equal to consumption. From 1939 Mitchell (1998a), BP from 1965. *Oil* in Mitchell (1998a) production from 1912 minus export from 1911, BP from 1969. *Gas* Darmstadter (1971) 1953-54, EL from 1955, BP from 1969. *Hydro* EL from 1961, BP from 1972. *Other Renewables* BP from 2008. *Nuclear* BP from 2012.

Iraq: no coal consumption. *Oil* since 1927 Mitchell (1998a) production minus crude and refined exports, EIA from 1980. *Gas* EL 1955-79, EIA from 1980. *Hydro* from 1971 WDI. No renewables or nuclear.

Israel: Coal Darmstadter (1971) from 1950, BP from 1965. *Oil* from 1950 Darmstadter (1971), from 1965 Mitchell (1998a), from 1980 EIA. *Gas* EL from 1971, EIA from 1980. *Renewables* from BP (2021).

Saudi Arabia: Coal from 2007 BP. *Oil* EL production from 1936 minus exports from 1948 Mitchell (1998a), BP from 1971 (and Gately, Al-Yousef, Al-Sheikh (2012)). *Gas* from 1961 EL and from 1965 BP. *Renewables* from BP (2021).

Syria: Coal Darmstadter (1971) from 1950, Bartoletto (2016) from 1971 (interpolation from 1966 until 1970, when consumption is stable). *Oil* Darmstadter (1971) from 1950, EIA 1968-70, Bartoletto (2016) from 1971 (1966-67 interpolated). *Gas* Darmstadter (1971) from 1955-65, EIA from 1968 (1966 and 1967 interpolated). *Hydro* EL from 1937, Bartoletto (2016) from 1971. *Renewables* from IRENA (2021).

Turkey: Coal EL and Mitchell (1998a) from 1868 (assuming that export is 10 percent such as in 1925-30), Darmstadter (1971) 1925-39, Mitchell (1998a) 1939-64, BP from 1965. *Oil* Darmstadter (1971) 1925-65, BP from 1966. *Gas* EL 1971-79, BP from 1986 (interpolated 1980-85). *Hydro* EL from 1936, BP from 1965. *Other Renewables* BP from 1967. *Biofuels* BP.

Africa

Algeria: Coal EL and Mitchell (1998a) 1917-24 (assuming that production is 3 percent of consumption), Darmstadter (1971) from 1925, BP from 1965. *Oil* 1916-24 EL (assuming that production is

2 percent of consumption, Darmstadter (1971) from 1925 until 1964, BP from 1965. *Gas* EL from 1946, BP from 1965. *Hydro* Darmstadter (1971) from 1925 until 1964, BP from 1965. *Other Renewables* BP from 2011.

Congo RD: *Coal* EL 1920-24 (production multiplied by 4.5 to compute consumption), Darmstadter (1971) from 1925 until 1964, interpolation 1965-79, EIA from 1980. *Oil* Darmstadter (1971) from 1925 until 1965, EIA from 1966 (completed with ENI 2017). *Gas* EIA from 2006. *Hydro* EIA 1929-59, Darmstadter (1971) 1960-65, EIA from 1966.

Egypt: *Coal* Darmstadter (1971) 1925-65, BP from 1965. *Oil* EL and Mitchell (1998a) from 1911 until 1924 (assuming that consumption is 1.8 production), Darmstadter (1971) 1925-65, BP from 1965. *Gas* EL 1963-65, BP from 1966. *Hydro* Darmstadter (1971) 1950-64, BP from 1965. *Other Renewables* BP from 1999.

Ethiopia-Eritrea: *Coal* from 2008 (no consumption of coal earlier) by ENI (2017). *Oil* Eia from 1980. *Gas* no gas. *Hydro* EIA from 1980. *Biofuels* EIA.

Libya: *Coal* Darmstadter (1971) 1925-65, EIA from 1980 (almost 0 between 1966 and 1980; interpolated), no longer coal consumption after 1997. *Oil* Darmstadter (1971) 1960-65, interpolation 1966-1979, EIA from 1980. *Gas* Bartoletto (2016) from 1971 to 1979, EIA from 1980. No hydro, renewables and nuclear.

Malawi: *Coal* Darmstadter (1971) 1925-65, interpolation 1966-79, EIA from 1980. *Oil* Darmstadter (1971) 1925-65, interpolation 1966-79, EIA from 1980. No *Gas*. *Hydro* Darmstadter (1971) 1962-65, interpolation 1966-79, EIA from 1980.

Morocco: *Coal* Darmstadter (1971) 1925-65, between 1966 and 1979 consumption is 80 percent of production (from Darmstadter (1971)) in Mitchell (1998a), EIA from 1980. *Oil* Darmstadter (1971) 1925-65, interpolation 1966-70, Bartoletto (2016) from 1971. *Gas* SPDP from 1953. *Hydro* EL from 1934, Darmstadter from 1925 to 1965, interpolation 1966-79, EIA from 1980.

Nigeria: *Coal* from 1905 consumption is 95 percent of production in Mitchell (1998a), EIA from 1980. *Oil* Darmstadter (1971) 1925-65, interpolation 1966-79, EIA from 1980. *Gas* EL from 1962, EIA from 1980. *Hydro* Darmstadter (1971) 1925-65, interpolation 1966-79, EIA from 1980. For a comparison of energy consumption from 1970, Enibe, Odukwe (1990).

Tunisia: *Coal* EL for 1916-24 (assuming that consumption is 5 times production such as from 1925), Darmstadter (1971) 1925-65, interpolation 1966-70, Bartoletto (2016) from 1971. *Oil* Darmstadter (1971) 1925-65, interpolation 1966-70, Bartoletto (2016) from 1971. *Gas* Darmstadter (1971) 1955-65, interpolation 1966-70, Bartoletto (2016) from 1971. *Hydro* EL and EIA from 1925. *Other Renewables* WDI from 2001.

South Africa: *Coal* Mitchell (1998a) from 1889 (assuming that production is 75 percent of production such as in 1925-30), Darmstadter (1971) 1925-65, rates of growth in BP 1966-79 (assuming 1965=1), EIA from 1980. *Oil* import in Mitchell (1998a), Darmstadter (1971) 1925-65, BP from 1965. *Gas* BP from 1980. *Hydro* BP from 1971. *Other Renewables* BP from 1996. *Nuclear* BP from 1984.

Zambia: *Coal* Darmstadter (1971) 1925-65, interpolation 1966-79, from 1980 Central Statistical Office of Zambia (<http://zambia.opendataforafrica.org>). *Oil* Darmstadter (1971) 1925-65, EIA from 1980, interpolation 1966-79. *Gas* no gas consumption. *Hydro* SPDP from 1950, EIA from 1980.

Zimbabwe: *Coal* EL from 1903 (assuming consumption equal to 80 percent of production such as in 1980 (because of exports towards South Africa), EIA from 1980 (data by Dutkiewicz (1991), p. 26 confirm those by EL and EIA). *Oil* EIA from 1980 with retropolation to 1950. *Gas* no gas. *Hydro* from 1952 EL and EIA from 1980 (only thermal production of electricity existed from 1935, Dutkiewicz (1991), pp. 18-9; p. 28). *Other Renewables* WDI from 2006.

In the case of Africa, it is crucial to include biomass in our series. In Table 16 biomass is included and our series is compared to the series by AEIS (Africa Energy Information System) for the years 2010-18.

Table 16. Comparison of two series relating to energy consumption in Africa in 2010-18 (Mtoe)

	1	2	3
	AEIS	WEC	Ratio 1/2
2010	852.999	836.572	1.020
2011	909.452	854.474	1.064
2012	976.827	875.306	1.116
2013	927.864	911.247	1.018
2014	970.628	936.828	1.036
2015	1014.841	940.701	1.079
2016	946.988	957.058	0.989
2017	997.320	970.901	1.027
2018	998.615	990.521	1.008

Source: the African series is that by AEIS (Africa Energy Information System) available in: <https://au-afrec.org/en/energy-browser>

Note: in col. 3 is the ratio between the series in col. 1 and that in col. 2.

5. Comparisons (consumption)

As already stated, the margins of error are certainly wider for traditional than modern sources. In addition, the reliability of the statistical reconstruction is diverse for any country (depending on the percentage of traditional and modern sources for any country and in time). In any case, such as always in statistical reconstructions, the error of the whole is less than the error of the parts: the margin of error is lower for the World series than for any macroarea, lower for macroarea than for country, lower for total consumption of a country than for any source of consumption.

C.H. Feinstein and M. Thomas (2002b) rightly recommended historians and statisticians to replace, in their reconstructions, “the point estimate given by the simple sample mean by an interval estimate” (p. 137). Where the errors are not correlated (such as in our case), an interval estimate could be computed through the square root of the sum of variances of errors of the series, as summarised through the following equation:

$$\epsilon = \sqrt{\sigma_x^2 + \sigma_y^2 \dots}$$

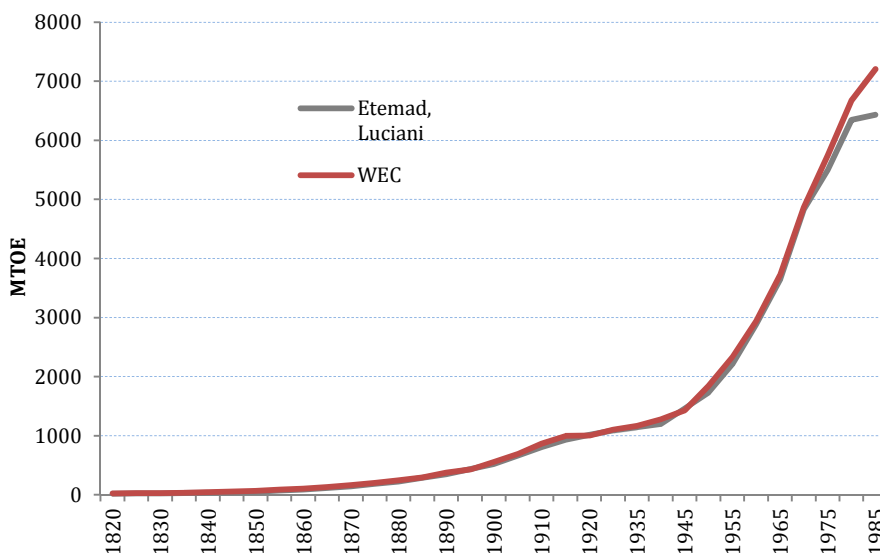
where ϵ is the error and σ^2 is the variance.

A precondition for the calculation is to “attach to each category a likely margin of error” (Federico-Tena (2018), p. 19). The possibility to define a likely margin of error does not always exist. The possibility of establishing interval estimates requires “the historian to gauge the reliability of each component of a series and then to derive the overall margin of error for the whole. It would be most helpful if these subjective evaluations were made by the compiler of an estimate” (Feinstein, Thomas (2002b), p. 157). For our series we could proceed from any basic series, and, attributing a percentage error, we could evaluate the final error and the final confidence interval. The premise would be, however, the attribution of a percentage error in an arbitrary way. Assuming, for my series of traditional sources, an error of 20 percent for any basic source, the result would be of an error of 5 to 10 percent. Assuming a percentage error of 40 percent, the result would be an error between 10 and 20 percent. Assuming a 10 percent error for any of my series per country, the result would be, for total consumption in the nineteenth century, an error of 3-4 percent. We would however, have to change in time the range of error (again in an arbitrary way). The confidence interval would diminish as we approach the present.

Whenever possible, I compared my series with the already available series, as explained in the previous summary of the methods used. In the following graphs, I compare my series of World energy consumption to the other available series; specify the correlations and explain the reasons for the differences. For western Europe in particular the series built by Bartoletto (2012) coincide with the series of the present database.

On the World scale consumption and production coincide. A comparison can be done between my series of modern sources and the series by Etemad, Luciani (1991), which includes production of modern sources for 5-years periods. The correlation is 0.999 (Figure 3).

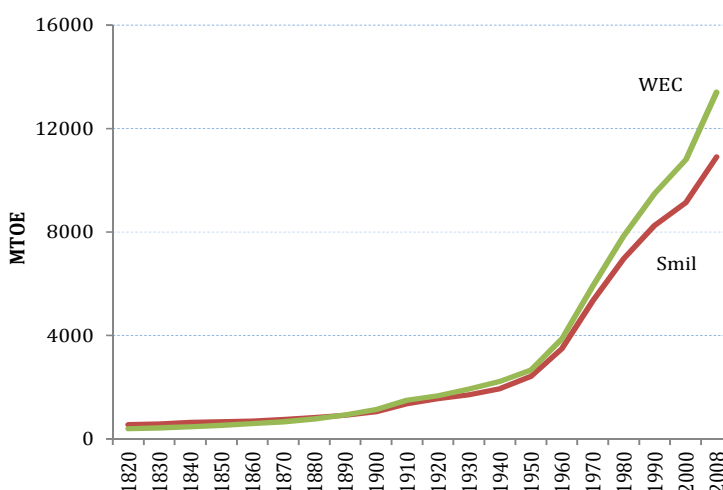
Figure 3. Two series of World energy consumption of modern sources 1820-1985 (Mtoe, 5-years)



Sources: Etemad, Luciani (1991) and present *Database*.

A long-term series of World consumption has been elaborated by Smil (2010) for the period 1800-2008. The series includes wood fuel as the only traditional source. In Figure 4, I present my series and that by Smil. My series is 28 percent lower in 1820 and 23 percent higher in 2008. The difference depends on the estimation of fuelwood (in Smil). In 1820, according to Smil, total consumption of “biofuels” was 22 Exajoules, that is 525 Mtoe, or 525 koe per capita per year (World population was 1 billion in 1820). The estimate by Smil would imply a daily per capita consumption of biofuels of more than 4 kg, which is higher than mine.

Figure 4. Comparison of two decadal series of World energy consumption 1820-2008 (Mtoe)



Sources: Smil (2010) and present *Database*. Smil includes in his series Coal, Oil, Natural Gas, Hydroelectricity, Nuclear electricity and Biofuels. Both the methods employed by Smil and the sources are not reported.

J-M. Martin-Amouroux, the author of *L'économie mondiale de l'énergie*. Paris, La Découverte, 1990, built in 2015 decadal series of energy consumption per macroareas and per source covering

the period 1800-2000. The information on the sources of his series and the methods followed in the statistical reconstruction (2015a and 2015b) are succinct. In the following Table 17, I report the original series by Martin-Amouroux per source, my series and a ratio between my series and those by Martin-Amoroux. Biomass in the series by Martin-Amoroux includes traditional fuels. For the comparison my series of biomass include traditional sources. Electricity comprises only primary electricity.

Table 17. Comparisons of two reconstructions of World energy consumption in 1820-2000 (decadal series in Mtoe)

Martin-Amouroux						
	Biomass	Coal	Oil	Gas	Electricity	Total
1820	352	12				364
1830	375	17				392
1840	403	28				431
1850	438	45				483
1860	459	82				541
1870	476	131	1			608
1880	518	207	3			728
1890	555	309	10	5		879
1900	581	480	25	5		1 091
1910	599	731	53	11	1	1 395
1920	589	712	91	19	4	1 415
1930	576	816	207	46	10	1 655
1940	558	898	292	67	17	1 832
1950	545	925	505	153	29	2 157
1960	608	1 252	1 030	374	59	3 323
1970	643	1 387	2 237	815	107	5 189
1980	789	1 748	3 010	1 158	211	6 916
1990	938	2 146	3 135	1 618	364	8 201
2000	1 096	2 116	3 542	2 026	465	9 245
WEC						
	Biomass	Coal	Oil	Gas	Electricity	Total
1820	363	25				388
1830	389	31				420
1840	420	45				465
1850	454	66				520
1860	481	107	0.1			588
1870	492	161	0.6			654
1880	524	242	3.9			769
1890	547	360	9	6	0.6	923
1900	573	529	20	6	6	1 135
1910	625	795	44	14	14	1 492
1920	659	875	87	21	20	1 662
1930	704	937	210	53	26	1 929
1940	744	1 067	296	77	36	2 220
1950	810	1 098	518	168	58	2 653
1960	926	1 384	1 054	405	94	3 863
1970	1 034	1 558	2 247	881	181	5 902
1980	1 161	1 927	3 050	1 279	418	7 836
1990	1 308	2 400	3 204	1 731	836	9 479
2000	1 454	2 572	3 579	2 103	1 065	10 773
WEC/Martin-Amouroux						
	Biomass	Coal	Oil	Gas	Electricity	Total
1820	1.03	2.07				1.07
1830	1.04	1.84				1.07
1840	1.04	1.60				1.08
1850	1.04	1.48				1.08
1860	1.05	1.30				1.09
1870	1.03	1.23	0.59			1.08
1880	1.01	1.17	1.28			1.06
1890	0.99	1.16	0.91	1.29		1.05

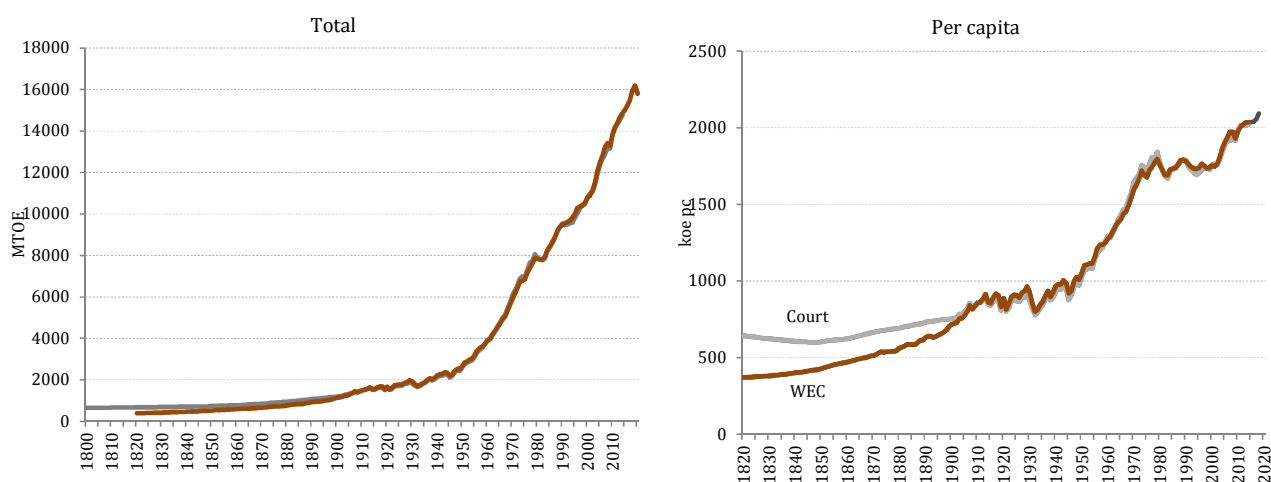
1900	0.99	1.10	0.81	1.27		1.04
1910	1.04	1.09	0.83	1.24	13.98	1.07
1920	1.12	1.23	0.96	1.10	5.05	1.17
1930	1.22	1.15	1.02	1.15	2.59	1.17
1940	1.33	1.19	1.01	1.15	2.09	1.21
1950	1.49	1.19	1.03	1.10	2.01	1.23
1960	1.52	1.11	1.02	1.08	1.60	1.16
1970	1.61	1.12	1.00	1.08	1.69	1.14
1980	1.47	1.10	1.01	1.10	1.98	1.13
1990	1.39	1.12	1.02	1.07	2.30	1.16
2000	1.33	1.22	1.01	1.04	2.29	1.17

Sources: Martin-Amouroux (2015) and present *Database*.

My total series is higher; between 4 and 17 percent. As expected, the main difference concerns biomass. My estimates are ordinarily higher (since they include firewood together with food and fodder). In 1880-1920 both reconstructions are quite similar. Electricity diverges, probably due to different procedures followed for the calculations (as recalled previously).

Victor Court (2016) is the author of a yearly series for the World on the whole between 1800 and 2014. His series are comparable to mine (Figure 5). Traditional series include in both cases food, fodder and firewood. Although built with different statistical procedures and different sources, the correlation of the total series is almost perfect: 0.999. In per capita terms, the modern sources are hardly different from about 1900. Traditional series instead are diverse (as already seen in Table 13). The series by Court rises less in the 19th century. In 1820, while my series is about 10,000 kcal per day, that by Court is 17-18,000. In the period 1820-1900 the increase of the series by Court is totally 17 percent (0.2 per year), while my series almost doubles (at the rate of 0.82 percent per year). The difference is more visible in the per capita series.

Figure 5. Comparison of two series of World consumption –total and per capita- (Mtoe Total and koe Per capita)- 1800-2020

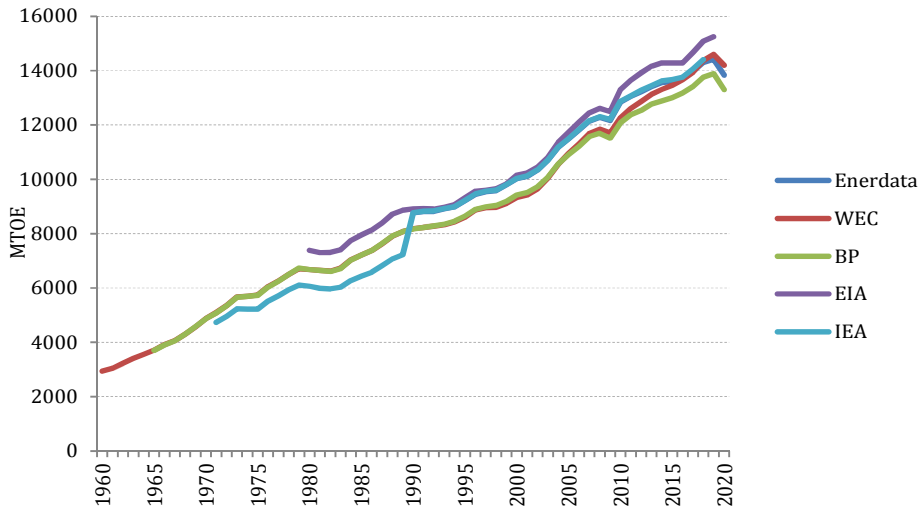


Sources: see text.

Note: my series starts in 1820 and finishes in 2020; the series by Court starts in 1800 and ends in 2014.

A comparison with the main available databases is possible only from 1965 onward. A comparison of my final series related to modern sources (in *Database*) and four series by Enerdata, BP, EIA and IEA of World energy consumption in 1965-2020 is presented in Figure 6. The correlation between the series is 0.90.

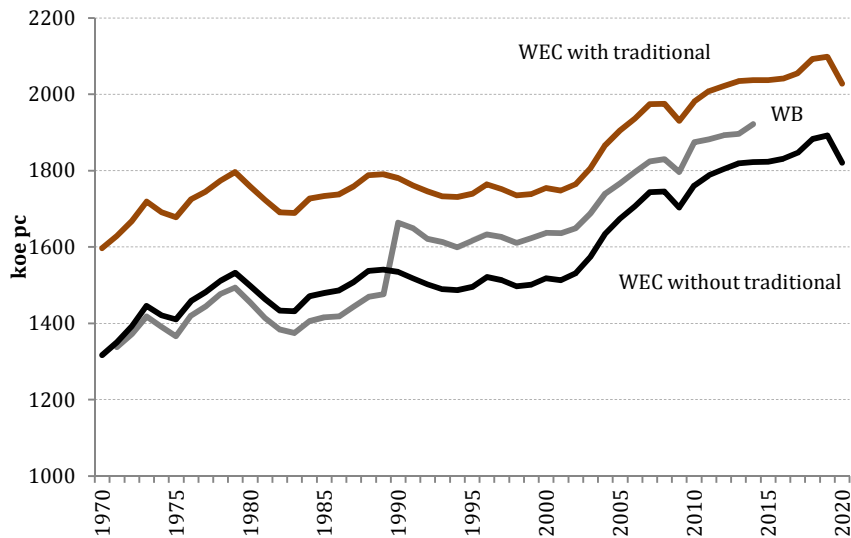
Figure 6. Five series of World energy consumption 1960-2020 (Mtoe)



Sources: WEC: see the present *Database*; Enerdata, *Global Energy Statistical Yearbook 2021*; BP, *Statistical Review of World Energy June 2021*; EIA, *International Data in: www.eia.gov/beta/international/data/browser*; IEA (2022), *Energy Balances of OECD Countries, Energy Balances of non-OECD Countries*.

In Figure 7 I report a comparison between my series (with traditional sources and without) and the series by the World Bank (in koe) (both in per capita terms) between 1971 and 2020. The correlation is 0.90.

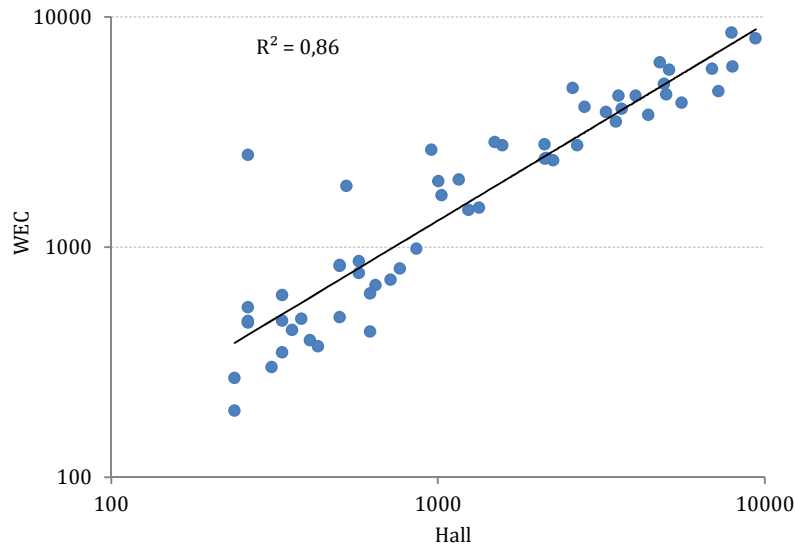
Figure 7. Two series of per capita World energy consumption 1970-2020 (Koe per capita)



Sources: present *Database* and Energy Use per capita in WDI. *World Bank. World Development Indicators (2021)*.

Few series of energy consumption include traditional sources. In Hall (1991) biomass is included (although only wood). In Fig. 8, WEC is compared with Hall (1991). The countries included are 57.

Figure 8. Two series of energy consumption in 1991 (biomass included; Koe per capita)



Sources: present *WEC Database* and Hall (1991).

6. GHG emissions

Traditional sources of energy are excluded from the existing databases of Greenhouse Gas emissions (GHG). The reason is that the emitted CO₂ in a year is used the year after by vegetables and woods in order to produce new biomass. The same holds true for biofuels (that in 2022 represented 0.58 percent of total energy consumption). The biofuels as well are excluded from our estimates. The following calculations include then the emissions of CO₂ by coal, oil, natural gas. See also the comments by Bartoletto, Del Mar Rubio Varas (2012). The equation used to compute emissions for any source is the following one:

$$CO_{2i} = 3.667 (P_i) (FO_i) (C_i)$$

where the emitted carbon CO₂ by a fossil source *i* originates from *P*, that is the production or consumption of a specific source *i* (in our case consumption); *FO* the oxidised share during the combustion; and *C* the carbon contained in the source. The *FO* share is always lower than 1, since not all the contained carbon is oxidised. A small share is exploited for non-energy purposes (Gilfillan, Marland (2021), pp. 1670-71). The non-oxidised share is higher for oil (0.08) than coal and natural gas (0.02 each). The CO₂ mass produced by the reaction of C with O is 3.667 times the mass contained in any source. This is the reason of the constant in the equation. The carbon oxidised is different for any fossil source (as you see in Table 18). Making coal equal to 100, the Carbon content of oil is 78 and that of natural gas 60. Coal is more pollutant than oil and oil more than natural gas.

Table 18. CO₂ emissions from fossil sources in kg per Gigajoule, in tons per MTOE and the oxidised share

	1	2	3	4
		Kg per Gj	tons of CO ₂ per MTOE	Oxidised share
Coal		94	3.94	0.98
Oil		73	3.06	0.92
Natural Gas		56	2.35	0.98

Source: Busche et al. (2010) (with coefficients utilised in official EU statistics).

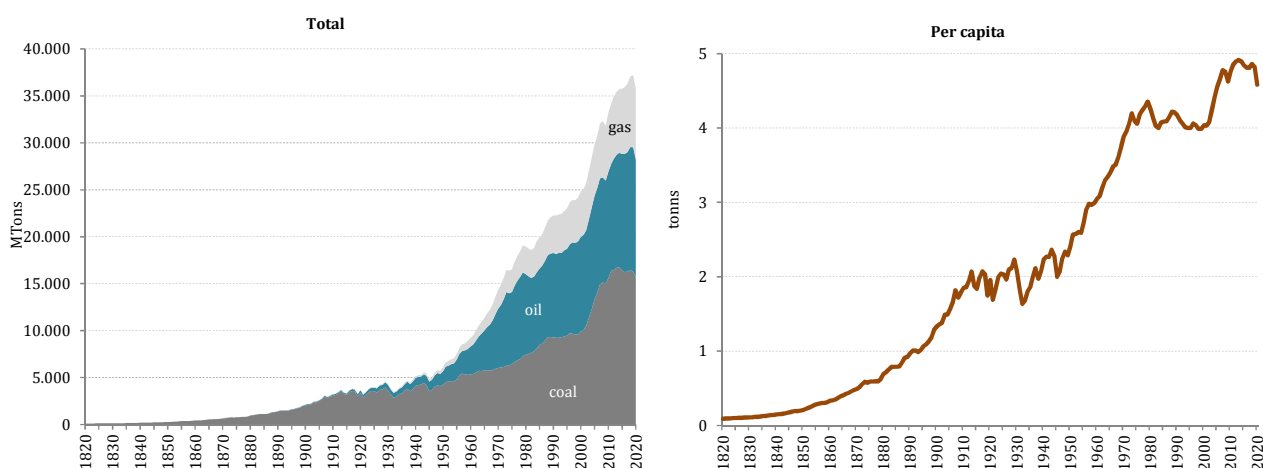
Note: the coefficients in the Table are the ones used in the present Database.

The dioxide Carbon in the atmosphere does not come only from fossil sources. Both cement production and gas flaring contribute. By gas flaring we mean the gas of the oil pit burn since it is too

expensive to recover it. It is not productive, but it contributes to CO₂ emissions. In 1950 these sources represented 1.4 percent of the total emissions of CO₂. They rose to 2.5 in 2000 and 3.7 in 2020 (Gilfillan, Marland, Boden, Andres (2021), in Databases of GHG emissions). Per country series are available for cement production from 1928 (Andrew (2019) and gas flaring from 1950. The range of uncertainty of these data is wider than that for the other sources of CO₂. These emissions are not included in our series.

Inevitably the profile of the emissions shows the same trend of the aggregate and per capita consumption (Fig. 9). Total emissions of CO₂ in 1820 amounted to 96 million tons and overcame 35,000 million in 2013. Over the years from 1820 until 2020 the emissions by fossil fuels amounted to 1,700,000 million tons: 60 percent of the total was emitted over the years 1820-1999 and 40 percent in 2000-2020.

Figure 9. World CO₂ emissions millions tons (Mtons) per source (coal, oil, gas) and per capita emissions (Tons) 1820-2020



Source: see text.

Table 19 shows that, over the 19th century, coal was almost the only source of CO₂ in the atmosphere. In 1950 it still represented 70 percent, and over the two first two decades of 21st century about 40. Looking at the last two centuries from 1820 until 2020, coal emissions represented half of all the emissions from fossil fuels. In per capita terms, emissions were much lower than 1 ton in 1820: they amounted to 0.092 tons. They reached 2 tons between the First and Second World War. Doubled from 2 to 4 between 1945 and 1970 and touched 5 tons between 2010 and 2019.

Table 19. CO₂ emissions per source on total emissions from fossil sources 1820-2020 (%)

	Coal	Oil	Natural Gas
1820	100.0	0.0	0.0
1900	96.6	2.7	0.7
1950	69.7	24.0	6.4
2000	40.0	40.6	19.5
2019	43.6	35.7	20.6
1820-2020	50.8	34.2	15.0

Source: see text.

The Kyoto protocol, subscribed in December 11th 1997, went into effect in February 2005. Its aim was to contain global warming by limiting the emissions. Apart from CO₂ engendered by the fossil sources of energy, the Kyoto protocol included other Greenhouse Gases (GHG):

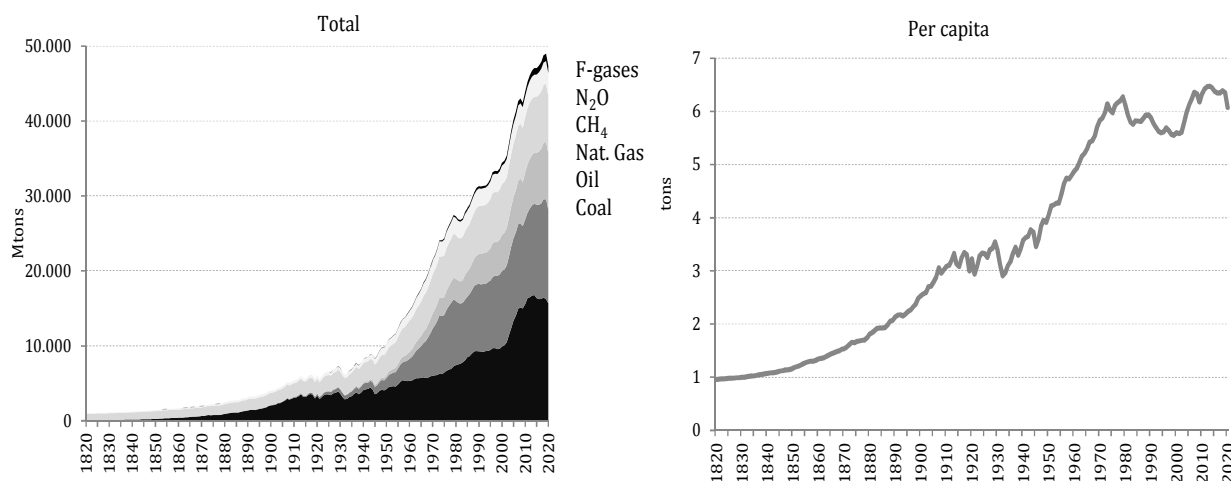
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Fluorinated gases (F-gases) such as chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HCFC).

Methane is mainly released in the atmosphere by the ruminants and is produced by their enteric fermentation; by manure; by rice cultivation; by agricultural activities and by biomass combustion. Nitrous oxide is produced by fertilization and, in particular, by the use of chemical fertilizers. F-gases are released by air conditioning plants and by the pharmaceutical industry.

These emissions have to be distinguished from those released by fossil fuels. However they can be added to CO₂ from the fossil sources by estimating their global warming potential. Since, for instance, the potential warming of methane is 21-25 higher than that of CO₂ released by the fossil sources, any ton of methane is multiplied by 21-25. The potential warming of nitrous oxide is 298-310 times that from fossil fuels and of F-gases 11,000-22,300. The unit of measure of these gases is the CO₂ equivalent or CO₂eq. On the whole GHG, their share was about 90 percent in 1820, 50 percent in 1900, 40 in 1950, 28 in 2000 and 24 in 2020 (Fig. 10). For the series of total emitted GHG, I used the database PRIMAP. Information on this database is available in Gütschow, Günther, Pflüger, *The PRIMAP-hist National Historical Emissions Time Series V2.3* in Databases of GHG emissions (M.O.EL series).

As we see in Fig. 10, adding the new sources of GHG, the resulting aggregate and per capita trends hardly change. The level of the GHG is, however, higher. In 2019 total GHG emitted by fossil and non fossil sources approached 50,000 million of CO₂eq. In 1820 total GHG were 1 million tons; 10,000 million were reached in 1950; 20,000 in 1969; 30,000 in 1988; 40,000 in 2005; 50,000 in 2022. In per capita terms, in 1820, when the fossil fuels contributed little to the consumption, the emissions of GHG touched 1 ton. Global per capita emissions overtook 6 tons from 1973 and, after a decline, again reached 6 tons in 2010-20.

Figure 10. Global GHG emissions (CO₂ and CO₂eq) in millions of tons (Mtons) per source (fossil and non fossil) and emissions per capita (in tons) 1820-2020

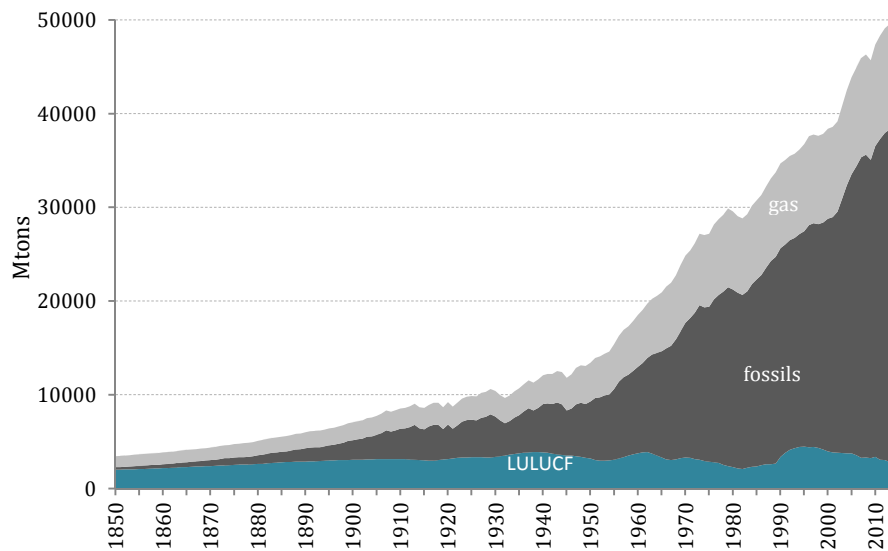


Sources: for the emissions from fossil sources of energy see text. GHG from non-fossil fuels see PRIMAP.

To these fluxes of CO₂ e CO₂eq have now to be added the fluxes deriving by the exploitation of soils, fields, marshy lands and in particular forests. These fluxes are globally referred to as LULUCF (*Land Use, Land-Use Change and Forestry*)(Houghton (1994), p. 305). The forests in particular store carbon during their growth. If the forests are broken down and wood is burnt or quitted unused, carbon is released again soon (when burnt) or slowly, over several years (when unused). Before 1900 it was certainly the main source of CO₂ (Houghton (1991), p. 99). At the end of the twentieth century, the first four countries according to the deforestation (and then according to the volume of the CO₂ from deforestation) were Brasil, Indonesia, Myanmar and Mexico. Their fluxes represented more than 50 percent of the world total (Houghton,1991, p. 107).

LULUCF are hard to estimate (Houghton, Hackler (1995). The range of uncertainty is 50 percent (Houghton (1991), p. 102). In Fig. 11, I added to previous estimates one of the available series, which covers the period 1850-2015 (Bastos (2021), p. 746). In 1850 the importance of the LULUCF was close to 90 percent of all GHG. Its share diminished to 60 percent in 1900, 35 in 1950 and 7 percent in 2015. With this source of GHG, the total level reached 50,000 million tons in 2015. In per capita terms the emissions in 2020 totaled 6,5 tons.

Figure 11. World emissions in millions of tons (Mton) of CO₂ and CO₂eq per source (fossils plus non fossil gases plus LULUCF) 1850-2015



Sources: see text for emissions from fossil sources and other gases. LULUCF is from Houghton, in Bastos (2021), Supplementary Materials. See also Houghton, Nassikas (2017). Another series of LULUCF has been computed by *Global Carbon Project (2020). Supplemental Data of Global Carbon Budget 2020 (Version 1.0)*. In this last series the annual values for LULUCF are higher than those in the present graph.

Once all greenhouse gas emissions have been estimated, it remains to be estimated the share of GHG which remains in the atmosphere. The emitted CO₂ is, in fact, absorbed by the vegetation and particularly from the soils and seas. A complete balance of emissions and absorptions has been elaborated within the *Global Carbon Project* (Friedlingstein et al. (2019); *Global Carbon Project. (2020). Supplemental Data of Global Carbon Budget 2020 (Version 1.0)*). See also the critical comments by Houghton (2020). This complete budget of emissions and absorptions shows that in the second decade of the 20st century, about half of the emissions of GHG million tons (from fossil sources, from other gases and from agriculture and forests) is absorbed by lands and seas. Then around 2020, every year were added to the GHG in the atmosphere about 25,000 Mtons. The range of uncertainty around the estimate is still wide (Houghton (2020), p. 3010: “we need more data and improved models”).

7. Comparisons (GHG)

Although some GHG emissions series start with 1751, their reliability is low well into the nineteenth century. Useful on the differences among the series on global emissions are Andrew (2020); Macknick (2011). Once made the series homogeneous (with the subtraction of gas from cement production and gas flaring), these series show a high correlation both among them and with the present WEC reconstruction.

Table 20. Databases of GHG, years covered by any series and correlation of any series with WEC series.

			years	correlations with trend	correlations without trend
1	CDIAC	Carbon Dioxide Information Analsi Center	1751-2019	0.999	0.817
2	IEA	International Energy Agency	1751-2019	0.999	0.818
3	CEDS	Community Emissions Data System	1750-2014	0.998	0.814
4	CAIT	Climate Data Explorer	1850-2016	0.999	0.937
5	PRIMAP	Potsdam Institute for Climate Impact Research	1750-2019	0.999	0.861

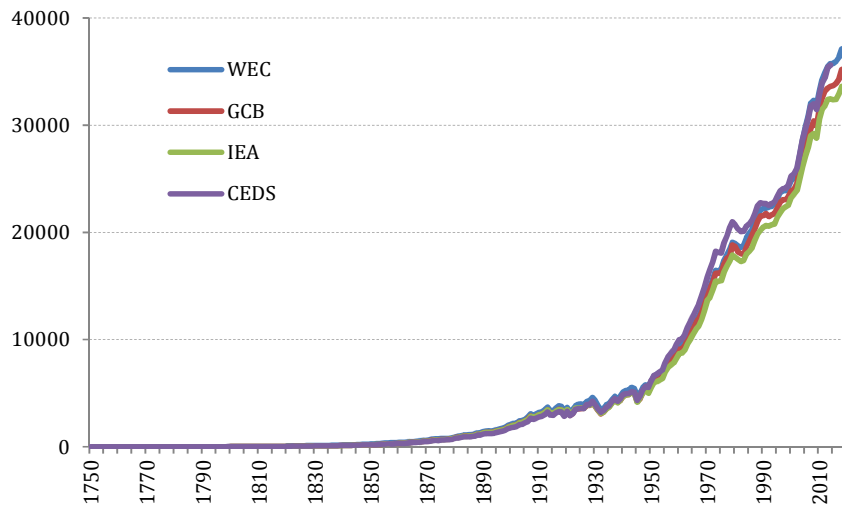
Sources: see the databases.

For the decade 2010-20, in the five series of Table 20, the difference between the highest estimate and the lowest is of 2 percent. For the years around 1820, making the present World emission series equal to 100, the series PRIMAP is equal to 62. With the exception of the WEC series, all the existing series underestimate coal consumption. Between 1820 and 1860 (when the only fuel was coal, the WEC series is higher by 40 percent when compared to the CDIAC and IEA.

In Table 20 you see the correlation of my WEC series on the emissions with the main databases devoted to the emissions of GHG. Since the series are not stationary, the correlation has been calculated without the trends.

Figure 12 presents four global series of GHG.

Figure 12. Four series of global emissions in millions of tons (Mtons) 1750-2020



Source: see text and Table 20.

REFERENCES

Databases

AEIS (Africa Energy Information System) AEIS: <https://au-afrec.org/en/energy-browser>

BP Statistical Review of World Energy June 2017
<http://www.bp.com/statisticalreview>

BP Statistical Review of World Energy June 2018
<http://www.bp.com/statisticalreview>

BP Statistical Review of World Energy June 2019
<http://www.bp.com/statisticalreview>

BP Statistical Review of World Energy June 2021
<http://www.bp.com/statisticalreview>

Bolt J., Inklaar R., De Jong H., Van Zanden J.L., *Rebasing 'Maddison': New Income Comparisons and the Shape of Long-Run Economic Development*, 2018.
<https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2020>

CEPAL – CEPALSTAT, *Estadísticas e indicadores ambientales, Producción y consumo de energía de recursos renovables y no renovables*
http://interwp.cepal.org/sisgen/Sisgen_MuestraFicha_puntual.asp

Daily per capita supply of calories
<https://ourworldindata.org/grapher/daily-per-capita-supply-of-calories-vs-gdp-per-capita>

EIA Energy Perspective Figures
<https://www.eia.gov/todayinenergy/detail.php?id=10>

Energy History. Joint Center for History and Economics. Series of data on energy consumption (including traditional sources)
<https://sites.fas.harvard.edu/~histecon/energyhistory/>

ENERDATA. *Global Energy Statistical Yearbook 2018*
<https://yearbook.enerdata.net>

ENERDATA. *Global Energy Statistical Yearbook 2019*
<https://yearbook.enerdata.net>

ENERDATA. *Global Energy Statistical Yearbook 2021*
<https://yearbook.enerdata.net>

EUROSTAT. *Daily Calorie Supply per Capita by Source*
https://ec.europa.eu/eurostat/web/products-datasets/-/t2020_rk100

Food consumption (Eurostat Database)
http://ec.europa.eu/eurostat/web/products-datasets/-/t2020_rk100

Maddison, A. (2010). *Historical Statistics of the World Economy*.
www.ggdc.net/maddison/historical_statistics/horizontal-file_02-2010.xls

Maddison Project Database (2013 edition)
[https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-](https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2018)

[2018](https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2018)

FAO Calorie consumption database

<http://www.fao.org/docrep/005/y4252e/y4252e04.htm>

FAO Database on Food supply (kcal, capita, day)

<https://www.fao.org/faostat/en/#search/Food%20supply%20kcal%2Fcapita%2Fday>

FAO Fuelwood consumption statistics

<http://www.fao.org/faostat/en/#data/FO>

FAO Food Security Portal

<http://www.foodsecurityportal.org/api/countries/fao-calorie-supply-p?page=1>

IEA Headline Global Energy Data (2017 edition)

http://www.iea.org/media/statistics/IEA_HeadlineEnergyData_2017.xlsx

IEA World Energy Balances (2021 edition)

<https://www.iea.org/data-and-statistics/data-products?filter=balances%2Fstatistics>

Latin American Population. Moxlad Database

<http://moxlad-staging.herokuapp.com/home/en>

Kuskova et al. Energy consumption in Czechoslovakia

Long term changes in social metabolism and land use in Czechoslovakia, 1830–2002

<http://www.wiso.boku.ac.at/sec/data-download/>

Shift Project Data Portal (series from Etemad-Luciani (1991) and EIA, US Energy Information Administration)

<http://www.tsp-data-portal.org/all-dataset>

WDI. World Bank. World Development Indicators (2021)

<https://data.worldbank.org/products/wdi>

World Population Prospects: The 2021 Revision: United Nations, Population Division, Department of Economic and Social Affairs

<https://esa.un.org/unpd/wpp/>

World Urbanization Prospects: The 2018 Revision: United Nations, Population Division, Department of Economic and Social Affairs

<https://esa.un.org/unpd/wpp/>

World Population Prospects 2019: United Nations, Population Division, Department of Economic and Social Affairs

<https://population.un.org/wpp/>

and United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. (including the years until 2020)

<http://creativecommons.org/licenses/by/3.0/igo/>

Databases of GHG emissions

CAIT, *Climate Data Explorer*. 2017. Washington, DC: World Resources Institute.

<http://cait.wri.org>

Gilfillan D., Marland G., Boden T., Andres R., *Global, Regional, and National Fossil-Fuel CO₂ Emissions: 1751-2018* CDIAC-FF, Research Institute for Environment, Energy, and Economics, Appalachian State University 2021.

<https://energy.appstate.edu/cdiac-appstate/data-products>

Global Carbon Project. *Supplemental data of Global Carbon Budget 2020 (Version 1.0)* [Data set]. Global Carbon Project (2020).
<https://doi.org/10.18160/gcp-2020>

Gütschow J., Günther A., Pflüger M., *The PRIMAP-Hist National Historical Emissions Time Series V2.3 (1750-2019)* 2021.
<https://zenodo.org/record/5175154#.YrA5fpVBzcs>

Hoesly R.M., Smith S.J., Feng L., Klimont Z., Janssens-Maenhout G., Pitkanen T., Seibert J.J., Vu L., Andres R.J., Bolt R.M., Dawidowski T., Kholod N., Kurokawa J., Li M., Liu L., Lu Z.10, Moura M.C.P., O'Rourke P.R., Zhang Q., *Historical (1750–2014) Anthropogenic Emissions of Reactive Gases and Aerosols from the Community Emissions Data System (CEDS)*
<https://gmd.copernicus.org/articles/11/369/2018/>

IEA, *CO₂ emissions from fuel combustion (Extended time series), GHG Emissions from Energy IEA, 2021*
<http://www.iea.org/statistics/topics/CO2emissions/>

Literature

- Adshead, S.A.M. (1974). "An Energy Crisis in Early Modern China". *Ch'ing-shih wen-t'i*, 3, 2: 20-8.
- Adshead, S.A.M. (1997). *Material Culture in Europe and China, 1400-1800*. London, McMillan.
- Alexandratos, N., Bruinsma, J., Hrabovszky, J. (1982). "Power Inputs From Labour, Draught Animals and Machines in the Agriculture of the Developing Countries". *European Review of Agricultural Economics*, 9: 127-55.
- Animal Traction in Rainfed Agriculture in Africa and South America* (1991). GTZ. Community Development Library.
- Andrew R.M. (2019). "Global CO₂ Emissions from Cement Production". *Earth System Science Data*, 11: 1675-710.
- Andrew R.M. (2020). "A Comparison of Estimates of Global Carbon Dioxide Emissions from Fossil Carbon Sources". *Earth System Science Data*, 12: 1437-465.
- Arnold, M., Köhlin, G., Persson, R., Shepherd, G. (2003). *Fuelwood Revisited: what has Changed in the Last Decade?* CIFOR, Occasional Paper 39.
- Bartoletto, S. (2012). *Energy and Economic Growth in Europe. The Last Two Centuries*. In: B. Chiarini, P. Malanima, *From Malthus' Stagnation to Sustained Growth*, Palgrave Macmillan, London, 2012: 52-68.
- Bartoletto, S. (2013). "Fossil Fuels Consumption and Economic Growth in Italy in the Last Two Centuries". *RCC Perspectives, Energy Transitions in History: Global Cases of Continuity and Change*: 37-42.
- Bartoletto, S. (2016). *Energia e crescita economica nei paesi del Mediterraneo*. Milano, B. Mondadori.
- Bartoletto S., del Mar Rubio Varas M. (2008). "Energy Transition and CO₂ Emissions in Southern Europe: Italy and Spain (1861-2000)", *Global Environment*, 2: 47-81.
- Bastos A., Hartung K., Nützel T.B., Nabel J.M.S, Houghton R.A, Pongratz J. (2021). "Comparison of Uncertainties in Land-Use Change Fluxes from Bookkeeping Model Parameterisation". *Earth System Dynamics*, 12: 1-18.
- Bhattacharyya, S.C. (2011). *Energy Economics*. London, Springer.
- Barzev, G. (2004). "Donkey Utilisation in Bulgaria". In: P. Starkey, D. Fielding (eds), *Donkeys, People and Development. A Resource Book of the Animal Traction Network* (ATNESA): 233-35.
- Bertoni, R., Cancela, V. (2010). "La "energía tradicional" en Uruguay. Los bueyes y caballos como convertidores (1882-2000)". Séptimas Jornadas de Investigación en Historia Económica Montevideo, 4 y 5 de agosto de 2010. Available in: <http://www.audhe.org.uy/jornadas/septimas-jornadas/Bertoni-y-Cancela-Energia-tradicional.pdf>
- Bertola, L., Ocampo, J.A. (2012). *The Economic Development of Latin America since Independence*. Oxford, Oxford University Press.
- Bielenberg, A. (2014). *Industrial Growth in Ireland; c. 1790-1910*. Ann Arbor, ProQuest.
- Biswanger, H.P., Donovan, G. (1987). *Agricultural Mechanisation: Issues and Options*. Washington, World Bank.
- Bodirsky, B.L., Rolinski, S., Biewald, A., Weindl, I., Popp, A., Lotze-Campen, H. (2015). "Global Food Demand Scenarios for the 21st Century". *PLoS ONE* 10(11): 1-27.
- Bolton, P. (2013). *Nuclear Energy Statistics*. House of Commons Library.
- Braudel, F. (1979). *Civilisation matérielle, économie et capitalisme, I, Le structures du quotidien, II, Les jeux de l'échange, III, Les temps du monde*. Paris, Colin.
- Busche J., Gores S., Herold A., Hermann H., Penninger G. (2010). *ETC/ACC Technical Paper 2010/4, European Topic Centre on Air and Climate Change (ETC/ACC)*.

- Caldwell, J., Missingham, B., Marck, J. (2001). "The population of Oceania in the second millennium". https://www.researchgate.net/publication/267818571_The_Population_of_Oceania_in_the_Second_Millennium
- Cartier, M. (1993). "La marginalisation des animaux en Chine". *Anthropozoologica*, 18: 7-15.
- Cartier, M. (1999). "L'homme et l'animal dans l'agriculture chinoise ancienne et moderne". *Études rurales*, 151-152: 179-97.
- CEPAL (1976). *Indicadores del desarrollo económico y social en America Latina*. Santiago de Chile, Cepal / Ilpes.
- Colby, W.H., Crook, F.W., Webb, S-E.H. (1992). *Agricultural Statistics of the People's Republic of China, 1949-90*. (U.S.) Economic Research Service, Washington DC.
- (CIA) Central Intelligence Agency (1979). *Energy Supplies in Eastern Europe: A Statistical Compilation*. Central Intelligence Agency, Washington D.C.
- Court, V. (2016) *Énergie, EROI et croissance économique dans une perspective de long terme*. Thèse pour l'obtention du Doctorat ès Sciences Économiques de l'Université Paris Nanterre Présentée et soutenue publiquement le 18 novembre 2016.
- Darmstadter, J. (with Polach, J.G., Teitelbaum, P.D.)(1971). *Energy in the World economy. A statistical review of trends in output, trade, and consumption since 1925*. Baltimore, John Hopkins Press.
- Dary, O., Imhoff-Kunsch, B. (2010). *Guide to Estimating Per Capita Consumption of Staple Foods Using Household Income And Expenditure Survey (HIES) Data*. ECSA/A2Z Monitoring and Evaluation Workshop Kampala, Uganda July 5-7 2010.
- Deane, P. (1948). *The Measurement of Colonial National Incomes*. NIESR occasional paper XII. Cambridge, Cambridge University Press.
- Debeir, J.C., Deléage, J.P., Hémerly, D. (1986). *Les servitudes de la puissance. Une histoire de l'énergie*. Paris, Flammarion.
- Dutkiewicz, R.K. (1991). *Energy Profile: Zimbabwe*. Lynnwood Ridge, National Energy Council.
- ENI (2017). *World Oil Review 2017*. Roma, Eni.
- ENI (2017). *World Gas and Renewables Review 2017*. Roma, Eni.
- ENI (2019). *World Oil Review 2019*. Roma, Eni.
- ENI (2019). *World Gas and Renewables Review 2019*. Roma, Eni.
- ENI (2021). *World Energy Review 2021*. Roma, Eni.
- Enibe, S.O., Odukwe, A.O. (1990). "Patterns of Energy Consumption in Nigeria". *Energy Conversion and Management*, 30, 2: 69-73.
- Etemad, B., Luciani, J. (1991). *World Energy Production 1800-1985*. Genève, Droz.
- Eurelectric (2003). *Efficiency in Electricity Generation*. Brussels, Eurelectric.
- Ehui, S., Poison, R. (1993). "A Review of the Economic and Ecological Constraints on Animal Draft Cultivation in Sub-Saharan Africa". *Soil & Tillage Research*, 27: 195-210.
- FAO (1955). *The State of Food and Agriculture 1955. Review of the Second Postwar Decade*. Rome, FAO.
- FAO (1965). *The State of Food and Agriculture 1965. Review of the Second Postwar Decade*. Rome, FAO.
- FAO (2013). *Mechanization for Rural Development: a Review of Patterns and Progress from around the World*. J. Kienzle, J.E. Ashburner, B.G. Sims (eds.). Rome, FAO.
- Federico, G., Tena-Junguito, A. (2019). "World trade, 1800-1938: a New Synthesis". *Revista de Historia Económica, Journal of Iberian and Latin American Economic History*, 37 (1): 9-41.
- Feinstein, C.H., Thomas, M. (2002a). "A Plea for Errors". *Historical Methods*, 35 (4): 155-65.
- Feinstein, C.H., Thomas, M. (2002b). *Making History Count. A Primer on Quantitative Methods for Historians*. Cambridge, Cambridge University Press.

- Fernandes, S.D., Trautmann, N.M., Streets, D.G., Roden, C.A., Bond, T.C. (2007). "Global Biofuel Use, 1850–2000". *Global Biogeochemical Cycles*, 21: 1-15.
- Findl, P., Helczmanovszki, H. (1974). *The Population of Austria*. Vienna, Austrian Academy of Sciences Institute of Demography.
- Floud, R., Fogel R.W., Harris, B., Chul Hong, S. (2011). *The Changing Body. Health, Nutrition, and Human Development in the Western World since 1700*. Cambridge, Cambridge University Press.
- Friedlingstein, P. et al. (2019). "Global Carbon Cycle 2019". *Earth System Science. Data*, 11: 1783–838.
- Gales, B. (2013). "A Dutch Revolution: Natural Gas in the Netherlands". *RCC Perspectives*, 2, Energy Transitions in History: Global Cases of Continuity and Change: 83-90.
- Gales, B., Kander, A., Malanima, P., Rubio, M. (2007). "North versus South. Energy Transition and Energy Intensity in Europe over 200 Years. *European Review of Economic History*, 11: 215-49.
- Gately, D., Al-Yousef, N., Al-Sheikh, H.M.H. (2012). "The Rapid Growth Of Domestic Oil Consumption In Saudi Arabia and the Opportunity Cost of Oil Exports Foregone". *Energy Policy*, 47: 57–68.
- Gifford, R.C. (1981). *Agricultural Mechanization in Development: Guidelines for Strategy Formulation*. Rome, FAO.
- Gilfillan D., Marland G. (2021), "CDIAC-FF: Global and National CO₂ Emissions from Fossil Fuel Combustion and Cement Manufacture: 1751–2017. *Earth System Science Data*, 13: 1667–80.
- Goe, M.R., McDowell, R.E. (1980). *Animal Traction: Guidelines for Utilization*. Department of Animal Science. Cornell University Ithaca, New York.
- Goklany, I.M.(1999). "Meeting Global Food Needs: the Environmental Trade-Offs Between Increasing Land Conversion and Land Productivity". *Technology*, 6: 107-30.
- Gross, N.T. (1971). "Economic Growth and the Consumption of Coal in Austria and Hungary 1831-1913". *Journal of Economic History*, 31, 4: 898-916.
- Hall, D.O. (1991). "Biomass Energy". *Energy Policy*, 19: 711-37.
- Harley, C.K. (1989). "Coal Exports and British Shipping, 1850-1913". *Explorations in Economic History*, 26: 311-38.
- Henriksson, M., Lindholm, E. (2000). "The Use and Role of Animal Draught Power in Cuban Agriculture: A Field Study in Havana Province". *Minor Field Studies 100*. Swedish University of Agricultural Sciences, Uppsala, Sweden.
- Houghton R.A. (1991). "Tropical Deforestation and Atmospheric Carbon Dioxide". *Climatic Change*, 19: 99-118.
- Houghton R.A. (1994). "The Worldwide Extent of Land-Use Change". *BioScience*, 44: 305-13.
- Houghton R.A. (2020). "Terrestrial Fluxes of Carbon in GCP Carbon Budgets". *Global Change Biology*, 26: 3006-14.
- Houghton R.A., Hackler J.L. (1995). *Continental Scale Estimates of the Biotic Carbon Flux from Land Cover Change: 1850 to 1980*, ORNL/EDDIAC-79, NDP-050, Oak Ridge National Laboratory, Oak Ridge, Tennessee 1995.
- Houghton R.A., Nassikas A.A. (2017). "Global and Regional Fluxes of Carbon from Land Use and Land Cover Change 1850–2015". *Global Biogeochemical Cycles*, 31: 456–72.
- Humphries, J. (2013). "The Lure of Aggregates and the Pitfalls of the Patriarchal Perspective: a Critique of the High Wage Economy Interpretation of the British Industrial Revolution". *Economic History Review*, 66, pp. 693-714.
- IEA (2008). *Energy in the Western Balkans*. Paris, IEA.
- IEA (2018), *Energy Balances of OECD Countries*. Paris, OECD.
- IEA (2018), *Energy Balances of non-OECD Countries*. Paris, OECD.

- IRENA (2021), *Renewable Energy Statistics 2021*. Abu Dhabi, The International Renewable Energy Agency.
- Iriarte-Goñi, I., Infante-Amate, J. (2017). "Las bioenergías en España. Una serie de producción, consumo y stocks entre 1860 y 2010". Sociedad de Estudios de Historia Agraria - Documentos de Trabajo, DT-SEHA n. 1702.
- Iriarte-Goñi, I., Infante-Amate, J. (2019). "Continuity, Change, and Geographical Differences in Spain's Firewood Consumption: A new Estimation (1860-2010)". *Historia Agraria*, 77: 33-57.
- İstatistik Göstergeler Statistical Indicators 1923-2013* (2013). Ankara, Türkiye istatistik kurumu, Turkish Statistical Institute.
- Jabbar, M.A. (1980). "Draft Power Shortage and Mechanization of Tillage in Bangladesh". *Bangladesh Journal of Agricultural Economics*, 3(1): 1-26.
- Jarvis, L.S. (1986). *Livestock Development in Latin America*. Washington, The World Bank.
- Johnson, F.X., Tella, P.V., Israilava, A., Takama, T., Diaz-Chavez, R., Rosillo-Calle, F., et al. (2010). *What Woodfuels can do to Mitigate Climate Change*. FAO Forestry Paper 162.
- Kander, A. (2002). *Economic Growth, Energy Consumption and CO2 Emissions in Sweden 1800-2000*. Lund, Lund University (*Lund Studies in Economic History*).
- Kander, A., Warde, P., Teives Henriques, S., Nielsen, H., Kulionis, V., Hagen, S. (2017). "International Trade and Energy Intensity during European Industrialization, 1870-1935". *Ecological Economics*, 139: 33-44.
- Kander, A., Warde, P. (2011). "Energy Availability from Livestock and Agricultural Productivity in Europe, 1815-1913: a New Comparison". *Economic History Review*, 64 (1): 1-29.
- Kander, A., Malanima, P., Warde, P. 2013. *Power to the People. Energy in Europe over the Last Five Centuries*. Princeton, Princeton University Press.
- Kearney, J. (2010). "Food Consumption Trends and Drivers". *Phil. Trans. R. Soc. B*, 365: 2793-807.
- Kennedy, L. (2013). "«The People's Fuel»: Turf in Ireland in the Nineteenth and Twentieth Centuries". *RCC Perspectives*, 2, Energy Transitions in History: Global Cases of Continuity and Change: 25-30.
- Kreuzberger, H. (1961). "Oil in Austria". *Annals of Public and Cooperative Economics*, 32 (2): 190-203.
- Kuskova, P., Gingrich, S., Krausmann, F. (2008). "Long Term Changes in Social Metabolism and Land Use in Czechoslovakia, 1830-2000: An Energy Transition Under Changing Political Regimes". *Ecological Economics*, 68: 394-407.
- Lateef, M., Hanjra, S.H (1992). "Role and Management of Herbivores for Draught Animal Power in Pakistan". FAO, Thai national AGRIS Centre. (<http://agris.fao.org/agris-search/search.do?recordID=TH2002002090>)
- Lhoste, Ph., Havard, M., Vall, É. (2010). *La traction animale*. Versailles, Éditions Quæ.
- Linde, C. van der (1991). *Dynamic International Oil Markets: Oil Market Developments and Structure, 1860-1990*. Berlin, Springer.
- Lindmark, M., Minde, K.B. (2018), 'Et energiregnskap for Fastlands-Norge 1835-2012'. *Heimen*: 157-77.
- Lindsay Falvey, J. (1985). *An Introduction to Working Animals*. Melbourne, MPW Australia.
- Livi Bacci, M. (1987). *Popolazione e alimentazione. Saggio sulla storia demografica europea*. Bologna, Il Mulino.
- Macknick J., (2011). "Energy and CO2 Emission Data Uncertainties". *Carbon Management*, 2: 189-205.
- Malanima, P. (1996). *Energia e crescita nell'Europa preindustriale*. Roma, La Nuova Italia Scientifica, 1996.
- Malanima, P. (2006). *Energy Consumption in Italy in the 19th and 20th Centuries*. Napoli, ISSM-CNR.

- Malanima, P. (2013). *Le energie degli italiani. Due secoli di storia*. Milano, B. Mondadori.
- Malaysia Energy Statistics Handbook 2015. Putrajaya, Malaysia, Suruhanjaya tenaga (energy commission).
- Martin, J-M. (1990). *L'économie mondiale de l'énergie*. Paris, La Découverte.
- Martin-Amouroux, J-M. (2015a). "Consommation mondiale d'énergie 1800-2000: définitions et mesures". *Encyclopédie de l'énergie*, Association des Encyclopédies de l'Environnement et de l'Énergie.
- Martin-Amouroux, J-M. (2015b). "Consommation mondiale d'énergie 1800-2000: les sources d'information". *Encyclopédie de l'énergie*, Association des Encyclopédies de l'Environnement et de l'Énergie.
- Martin-Amouroux, J-M. (2015c). "Consommation mondiale d'énergie 1800-2000: les résultats". *Encyclopédie de l'énergie*, Association des Encyclopédies de l'Environnement et de l'Énergie, Article: 061.
- Matthewman, R.W., Dijkman, J.T., Zerbini, E. (w.d.). "The Management and Husbandry of Male and Female Draught Animals: Research Achievements and Needs".
<http://www.fao.org/wairdocs/ilri/x5483b/x5483b0z.htm>
- Michotte, P.L. (1929). "L'industrie Belge du charbon". *Annales de Géographie*, 38 (211): 47-66.
- Ministry of Mines and Energy EPE (2007) *Brazilian Energy Balance 2007*, EPE, Brasilia.
- Mitchell, B.R. (1998a). *International Historical Statistics. Africa, Asia & Oceania 1750-1993*. London, McMillan.
- Mitchell, B.R. (1998b). *International Historical Statistics. Europe 1750-1993*. London, McMillan.
- Mitchell, B.R. (1983). *International Historical Statistics. The Americas and Australasia*. London, McMillan.
- Mitchell, B.R. (2013). *International Historical Statistics*. London, Palgrave.
- Mrema, G., Soni, P., Rolle, R. (2015). *A Regional Strategy for Sustainable Agricultural Mechanization. Sustainable Mechanization Across Agri-Food Chains in Asia and the Pacific Region*. Bangkok, FAO.
- Mulhall, M.G. (1884). *Dictionary of Statistics*. London, Routledge.
- Natarajan, A., Chander, M., Bharathy, N. (2016). "Relevance of Draught Cattle Power and its Future Prospects in India: a Review". *Agricultural Reviews*, 37 (1): 49-54.
- Naughton, B. (2007). *The Chinese Economy. Transitions and Growth*. Cambridge, MIT Press.
- Netschert, B.C., Schurr, S.H. (1960). *Energy in the American Economy, 1850-1975; an Economic Study of its History and Prospects*. Baltimore, Johns Hopkins Press.
- Newell, R.G., Raimi, D. (2020). *Global Energy Outlook Comparison. Methods: 2020 Update. Resources for the Future*. Report 20-06.
- Nielsen, H. (2017). *Coal, Commerce and Communism. Empirical Studies on Energy History in the Czech Republic*. Lund, Lund University (*Lund Studies in Economic History*).
- Nielsen, H., Warde, P., Kander, A. (2017). "East versus West: energy intensity in coal-rich Europe". In H. Nielsen, *Coal, commerce and communism. Empirical studies on energy history in the Czech Republic*. Lund, Lund University (*Lund Studies in Economic History*).
- O'Carrol, N. (2004). *Forestry in Ireland - A concise history*. Belfield (Dublin), COFORD, National Council for Forest Research and Development.
- O'Connor, P.A., Cleveland C.J. (2014). "U.S. Energy Transitions 1780–2010". *Energies*, 7(12): 7955-93.
- O'Connor, P.A., *Commercial and Traditional Energy Consumption in the United States, 1780-2010*. Boston University, Department of Geography & Environment (I thank the author of this PhD. Thesis for sharing with me his results).
- Ortiz-Laurel, H., Rössel, D. (w.d.). "Present Situation and Prospective of Draught Animals in Mexico". Available in: www.fao.org/tempref/upload/Agrippa/682_en.doc

- Otepka, P., Grynenko, V. (2018). "Trends and Perspectives of Fuelwood Production in Europe". *Acta Regionalia et Environmentalica. Nitra, Slovaca Universitas Agriculturae Nitriae*, 1: 5–9.
- Peng Tien-song (1971). "Present Problems and the Future of Agricultural Mechanization in Taiwan, Republic of China". In *Agricultural Mechanization in South East Asia*. Farm Machinery Industrial Research Corp.: 109-12.
- Ramaswamy, N.S. (1985). "Draught Animal Power in the third World", in J. Lindsay Falvey (1985). *An introduction to working animals*: 1-7.
- Ramaswamy, N.S. (1994). "Draught Animals and Welfare". *Revue scientifique et technique (International Office of Epizootics)*, 13 (1): 195-216.
- Republic of Serbia (2016). *Energy Sector Development Strategy of the Republic of Serbia for the Period by 2025 with Projections by 2030*. Belgrade, Ministry of Mining and Energy.
- Ríos, A., Cárdenas, J. (2003). "La tracción animal en Cuba: una perspectiva histórica". *Instituto de Investigaciones de Mecanización Agropecuaria (IIMA), La Habana, Cuba*, available in: <http://www.recta.org/libroTA.html>
- Rubio, M. del Mar (2005). "Energía, economía y CO2: España 1850-2000". Departamento de Economía y Empresa Universidad Pompeu Fabra de Barcelona, Cuadernos Económicos de ICE n. 70.
- Rubio, M. del Mar, Tafunell, X. (2014). "Latin American Hydropower: a Century of Uneven Evolution". *Renewable and Sustainable Energy Reviews*, 38: 323–34 (many thanks to Mar for sharing the original series with me).
- Rubio, M. d. Mar, Yáñez, C., Folchi, M., Carreras, A. (2010). "Energy as an indicator of modernization in Latin America, 1890–1925". *Economic History Review*, 63 (3): 769–804.
- Singh, G. (2015). "Agricultural Mechanisation Development in India". *Indian Journal of Agricultural Economics*, 70 (1): 64-82.
- Smil, V. (1986). "Food Production and Quality of Diet in China". *Population and Development Review*, 12 (1): 25-45.
- Smil V. (2010). *Energy Transitions. History, Requirements, Prospects*. Santa Barbara, Denver, Oxford, Praeger.
- Spulber, N. (2003). *Russia's Transitions: from Late Tsarism to the New Millennium*. Cambridge, CUP.
- Srb, V.(1962). "Population development and population policy in Czechoslovakia". *Population Studies: A Journal of Demography*, 16: 147-59.
- Starkey, P. (2000). "The History of Working Animals in Africa". In R.M. Blench, K. MacDonald (eds), *The Origins and Development of African Livestock: Archaeology, Genetics, Linguistics and Ethnography*. University College London Press, London: 478-502.
- Starkey, P. (2010). *Livestock for Traction: World Trends, Key Issues and Policy Implications*. Rome, FAO.
- Suhara, M. (2017). *Russian Industrial Statistics*. Russian Research Center Institute of Economic Research Hitotsubashi University Kunitachi, Tokyo, Japan.
- Szűcs, V., Szabó, E., Bánáti, D. (2013). "Short Overview of Food Consumption Databases". *Czech Journal of Food Science*, 31: 541–46.
- Tabatabaeefar, A., Omid, M. (2005). "Current Status of Iranian Agricultural Mechanization". *Journal of Agriculture & Social Sciences*, 1, 2: 196-201.
- Teives Henriques, S. (2009). *Energy Consumption in Portugal 1856-2006*. Napoli, ISSM-CNR.
- Teives Henriques, S. (2011). *Energy Transitions, Economic Growth and Structural Change: Portugal in a Long-Run Comparative Perspective*. Lund, Lund University (*Lund Studies in Economic History*).
- Teives Henriques, S., Sharp, P. (2016). "The Danish Agricultural Revolution in an Energy Perspective: a Case of Development with Few Domestic Energy Sources". *Economic History Review*, 69 (3): 844-69 (and Online Supporting Information).

- Thomson, E. (2003). *The Chinese Coal Industry: an Economic History*. London New York, Routledge Carson.
- UN (1951). *Review of Economic Conditions in the Middle East*. Supplement to World Economic Report, 1949-50. New York, UN.
- UN (1952). *World Energy Supplies in Selected Years, 1929-1950*. New York, UN.
- UN (1953). *Review of Economic Conditions in the Middle East*. Supplement to World Economic Report, 1951-52. New York, UN.
- UN (1957). *Energy in America Latina*. Geneva, UN.
- UN (1987). *Energy Statistics. Definitions, Units of Measure, and Conversion Factors*. New York, UN.
- Unger, R.W., Thistle, J. (2013). *Energy Consumption in Canada in the 19th and 20th Centuries. A statistical Outline*. Napoli, ISSM-CNR.
- Vlaeva, R., Barzev, G., Georgieva, S., Ivanova, I. (2017). "Dynamics in the Development of Donkey Population in Bulgaria". *Trakia Journal of Sciences*, 1: 56-59.
- Warde, P. (2006). "Fear of Wood Shortage and the Reality of the Woodland in Europe, c. 1450-1850." *History Workshop Journal*, 62: 28-57.
- Warde, P. (2007). *Energy Consumption in England and Wales 1560-2000*. Napoli, ISSM-CNR.
- Warde, P. (2019). "Firewood Consumption and Energy Transition: a Survey of Sources, Methods and Explanations in Europe and North America". *Historia Agraria*, 77: 7-32.
- Wright, T. (2008, 1st ed. 1984). *Coal Mining in China's Economy 1895-1937*. Cambridge. Cambridge University Press.
- Wu, K. (1995). *Energy in Latin America. Consumption, Production and Future Growth*. Westport (Connecticut), London, Praeger.
- Xiangfei Bai, Hua Ding, Jinjing Lian, Dong Ma, Xiaoyu Yang, Nanxiang Sun, Wenlin Xue & Yijun Chang (2018). "Coal Production in China: Past, Present, and Future Projections". *International Geology Review*, 60:5-6, 535-47.
- Yáñez, C., Rubio, M. del Mar, Jofré, J., Carreras, A. (2013). "El consumo aparente de carbón mineral en América Latina, 1841-2000. Una historia de progreso y frustración". *Revista de Historia Industrial*, 21: 25-77.

WEC THE DATABASE 1820-2020

The original series have been calculated per source, per country and per year from 1820 until 2020. In the following *Database*, I report the national series per decade and only the aggregate consumption for each country. I report the series on population to allow per capita calculations of total consumption and consumption per source.

Total consumption of energy per macroarea is not equal to total consumption of the 72 countries of our sample. The first has been adjusted to the population of any macroarea and the World, while the second refers to the total of 72 countries.

Population

Table P.1 Population per macroarea and the World total 1820-2020 (000)

	1	2	3	4	5	6	7	8	
	WE	EE	NA	LA	O	As	ME	Af	WORLD
1820	138,951	91,222	10,427	20,792	1,624	685,253	25,000	74,000	1,047,270
1821	140,431	92,008	10,748	21,052	1,621	687,489	25,095	74,284	1,052,728
1822	141,918	92,801	11,078	21,316	1,620	689,732	25,190	74,568	1,058,224
1823	143,423	93,601	11,472	21,585	1,621	691,983	25,285	74,854	1,063,824
1824	144,946	94,409	11,878	21,858	1,625	694,240	25,381	75,141	1,069,477
1825	146,451	95,223	12,295	22,135	1,627	696,506	25,477	75,429	1,075,142
1826	147,916	96,045	12,661	22,417	1,625	698,778	25,573	75,718	1,080,733
1827	149,355	96,875	13,025	22,703	1,624	701,058	25,670	76,009	1,086,318
1828	150,754	97,711	13,359	22,994	1,622	703,346	25,767	76,300	1,091,853
1829	152,015	98,556	13,690	23,290	1,623	705,640	25,865	76,592	1,097,270
1830	153,072	99,408	14,028	23,590	1,628	707,943	25,962	76,886	1,102,518
1831	154,325	100,268	14,451	23,895	1,628	710,253	26,061	77,181	1,108,061
1832	155,440	101,135	14,902	24,206	1,631	712,570	26,159	77,476	1,113,520
1833	156,587	102,010	15,354	24,521	1,639	714,895	26,258	77,773	1,119,039
1834	157,713	102,893	15,807	24,841	1,642	717,228	26,358	78,072	1,124,554
1835	159,107	103,785	16,263	25,167	1,644	719,568	26,457	78,371	1,130,361
1836	160,372	104,684	16,719	25,498	1,651	721,916	26,558	78,671	1,136,068
1837	161,658	105,591	17,177	25,834	1,655	724,271	26,658	78,973	1,141,817
1838	162,903	106,506	17,637	26,177	1,668	726,634	26,759	79,275	1,147,560
1839	164,248	107,430	18,098	26,525	1,681	729,005	26,860	79,579	1,153,428
1840	165,565	108,362	18,577	26,879	1,697	731,384	26,962	79,884	1,159,310
1841	166,904	109,303	19,235	27,239	1,728	733,770	27,064	80,191	1,165,435
1842	168,215	110,252	19,894	27,606	1,749	736,164	27,166	80,498	1,171,545
1843	169,484	111,210	20,556	27,980	1,760	738,566	27,269	80,806	1,177,631
1844	170,824	112,176	21,219	28,361	1,774	740,976	27,372	81,116	1,183,818
1845	172,219	113,151	21,885	28,749	1,791	743,394	27,476	81,427	1,190,091
1846	173,473	114,135	22,553	29,144	1,806	745,819	27,580	81,739	1,196,249
1847	173,685	115,128	23,223	29,548	1,824	748,253	27,684	82,053	1,201,397
1848	173,280	116,129	23,895	29,961	1,848	750,694	27,789	82,367	1,205,963
1849	173,182	117,140	24,753	30,382	1,891	753,144	27,894	82,683	1,211,069
1850	173,404	118,161	25,666	30,814	1,925	755,603	28,000	83,000	1,216,574
1851	173,748	119,282	26,820	31,183	1,954	754,557	28,097	83,337	1,218,975
1852	174,498	120,385	27,712	31,556	2,025	753,511	28,194	83,675	1,221,557
1853	175,237	121,500	28,707	31,935	2,107	752,468	28,291	84,014	1,224,259
1854	175,912	122,625	29,503	32,319	2,197	751,425	28,389	84,355	1,226,726
1855	176,081	123,762	30,402	32,708	2,291	750,385	28,487	84,697	1,228,814
1856	176,906	124,911	31,303	33,103	2,370	749,345	28,586	85,041	1,231,565
1857	177,908	126,071	32,206	33,503	2,459	748,307	28,684	85,386	1,234,524
1858	178,902	127,243	33,110	33,909	2,536	747,271	28,783	85,732	1,237,487
1859	180,101	128,426	34,017	34,321	2,578	746,236	28,883	86,080	1,240,642
1860	181,210	129,622	34,928	34,738	2,623	745,202	28,983	86,429	1,243,735
1861	183,127	130,830	35,852	35,162	2,650	744,170	29,083	86,780	1,247,652
1862	184,183	132,049	36,736	35,591	2,692	743,139	29,183	87,132	1,250,707
1863	185,453	133,282	37,622	36,027	2,750	742,109	29,284	87,485	1,254,013
1864	186,657	134,526	38,508	36,469	2,822	741,082	29,385	87,840	1,257,290
1865	187,871	135,784	39,395	36,917	2,896	740,055	29,487	88,196	1,260,601
1866	188,790	137,054	40,283	37,372	2,958	739,030	29,589	88,554	1,263,629
1867	189,847	138,337	41,171	37,834	3,009	738,006	29,691	88,913	1,266,809
1868	190,738	139,633	42,057	38,302	3,076	736,984	29,794	89,274	1,269,858
1869	190,097	140,942	42,950	38,777	3,142	735,963	29,897	89,636	1,271,405
1870	191,181	142,229	43,866	39,258	3,184	734,943	30,000	90,000	1,274,661
1871	191,663	143,726	44,787	39,861	3,095	738,440	30,210	90,604	1,282,387
1872	192,511	145,241	45,890	40,476	3,151	741,955	30,422	91,212	1,290,858
1873	193,818	146,772	47,000	41,103	3,209	745,485	30,636	91,824	1,299,848
1874	195,229	148,321	48,107	41,743	3,289	749,033	30,851	92,440	1,309,013
1875	196,757	149,887	49,199	42,394	3,376	752,598	31,067	93,061	1,318,339

1876	198,373	151,471	50,296	43,070	3,454	756,179	31,285	93,685	1,327,814
1877	200,050	153,072	51,389	43,759	3,532	759,778	31,505	94,314	1,337,399
1878	201,740	154,692	52,482	44,462	3,612	763,393	31,726	94,947	1,347,055
1879	203,408	156,331	53,585	45,179	3,699	767,026	31,948	95,584	1,356,760
1880	204,833	157,987	54,713	45,911	3,791	770,676	32,172	96,226	1,366,310
1881	206,162	159,663	56,068	46,657	3,878	774,344	32,398	96,872	1,376,041
1882	207,427	161,357	57,402	47,419	3,968	778,029	32,625	97,522	1,385,750
1883	208,654	163,071	58,741	48,197	4,082	781,731	32,854	98,176	1,395,507
1884	210,078	164,804	60,082	48,990	4,211	785,452	33,084	98,835	1,405,536
1885	211,420	166,557	61,416	49,799	4,316	789,189	33,317	99,498	1,415,514
1886	212,880	168,330	62,744	50,596	4,415	792,945	33,550	100,166	1,425,627
1887	214,278	170,123	64,074	51,422	4,519	796,719	33,786	100,838	1,435,759
1888	215,664	171,937	65,410	52,264	4,621	800,510	34,023	101,515	1,445,944
1889	217,146	173,771	66,745	53,124	4,714	804,319	34,261	102,196	1,456,277
1890	218,535	175,627	68,081	54,002	4,804	808,149	34,502	102,882	1,466,582
1891	219,926	177,515	69,445	54,897	4,898	812,709	34,744	103,573	1,477,705
1892	221,401	179,424	70,805	55,809	4,984	817,295	34,987	104,268	1,488,973
1893	222,862	181,355	72,162	56,742	5,058	821,907	35,233	104,968	1,500,286
1894	224,613	183,307	73,520	57,694	5,132	826,544	35,480	105,672	1,511,963
1895	226,328	185,282	74,877	58,665	5,206	831,208	35,729	106,381	1,523,676
1896	228,234	187,278	76,235	59,656	5,278	835,898	35,980	107,095	1,535,655
1897	230,257	189,297	77,593	60,668	5,353	840,615	36,232	107,814	1,547,830
1898	232,446	191,339	78,956	61,700	5,420	845,358	36,486	108,538	1,560,243
1899	234,510	193,404	80,326	62,755	5,481	850,128	36,742	109,266	1,572,611
1900	236,384	195,493	81,692	63,832	5,540	854,926	37,000	110,000	1,584,867
1901	238,470	198,314	83,259	65,045	5,629	861,091	37,150	111,087	1,600,044
1902	240,586	201,179	84,963	66,191	5,722	867,300	37,301	112,185	1,615,427
1903	242,658	204,090	86,597	67,509	5,810	873,554	37,452	113,293	1,630,965
1904	244,751	207,048	88,312	68,695	5,906	879,853	37,604	114,413	1,646,581
1905	246,747	210,053	90,149	69,997	6,009	886,198	37,757	115,543	1,662,453
1906	248,898	213,105	91,867	71,429	6,114	892,588	37,910	116,685	1,678,596
1907	250,960	216,206	93,750	72,965	6,223	899,025	38,064	117,838	1,695,030
1908	253,148	219,357	95,680	74,332	6,341	905,507	38,218	119,003	1,711,586
1909	255,316	222,559	97,645	75,922	6,471	912,037	38,373	120,178	1,728,501
1910	257,477	225,811	99,755	77,573	6,610	918,614	38,529	121,366	1,745,736
1911	259,502	229,060	101,441	79,129	6,779	925,238	38,685	122,565	1,762,399
1912	261,222	232,363	103,092	80,868	6,988	931,909	38,842	123,776	1,779,061
1913	263,085	235,722	105,238	82,202	7,201	938,632	39,000	125,000	1,796,080
1914	263,630	234,915	107,384	83,223	7,357	945,249	39,457	127,047	1,808,262
1915	262,984	234,118	108,922	83,991	7,428	951,913	39,919	129,128	1,818,401
1916	262,575	233,330	110,365	84,625	7,439	958,624	40,386	131,242	1,828,586
1917	262,048	232,551	111,877	85,817	7,455	965,382	40,859	133,391	1,839,381
1918	261,110	231,782	113,106	87,276	7,566	972,188	41,338	135,576	1,849,942
1919	262,474	231,021	113,784	88,838	7,792	979,041	41,822	137,796	1,862,569
1920	263,073	230,270	115,437	90,178	8,029	985,945	42,311	140,053	1,875,297
1921	259,633	229,374	117,752	91,874	8,192	994,909	42,807	142,346	1,886,887
1922	260,312	230,259	119,403	93,651	8,361	1,003,954	43,308	144,677	1,903,926
1923	262,441	232,232	121,397	95,580	8,534	1,013,081	43,815	147,047	1,924,127
1924	264,497	235,846	123,701	97,545	8,708	1,022,291	44,329	149,455	1,946,371
1925	266,281	240,377	125,578	99,415	8,893	1,031,585	44,848	151,902	1,968,879
1926	268,180	245,107	127,308	101,435	9,073	1,040,963	45,373	154,390	1,991,829
1927	269,778	249,566	129,139	103,460	9,251	1,050,427	45,904	156,918	2,014,443
1928	271,435	253,696	130,806	105,318	9,415	1,059,977	46,442	159,488	2,036,576
1929	273,044	257,413	132,274	108,119	9,554	1,069,613	46,986	162,100	2,059,103
1930	274,944	260,586	133,876	109,497	9,681	1,079,338	47,536	164,754	2,080,211
1931	276,960	263,444	135,010	111,911	9,792	1,089,150	48,092	167,452	2,101,812
1932	278,536	265,304	135,946	113,931	9,889	1,099,052	48,656	170,195	2,121,508
1933	280,041	266,903	136,813	115,978	9,987	1,109,044	49,225	172,982	2,140,973
1934	281,600	268,929	137,719	118,077	10,084	1,119,126	49,802	175,815	2,161,152
1935	283,191	271,021	138,704	120,228	10,179	1,129,301	50,385	178,694	2,181,702
1936	285,055	273,796	139,631	122,444	10,276	1,139,567	50,975	181,620	2,203,365
1937	286,667	277,791	140,509	124,715	10,384	1,149,928	51,572	184,594	2,226,159

1938	288,560	282,619	141,628	127,009	10,500	1,160,382	52,176	187,617	2,250,491
1939	290,586	287,394	142,806	129,485	10,627	1,170,931	52,787	190,690	2,275,307
1940	291,467	289,952	144,018	131,760	10,745	1,181,583	53,405	193,813	2,296,743
1941	291,346	284,821	145,429	134,602	10,846	1,195,010	54,031	196,986	2,313,071
1942	292,696	279,961	147,040	137,460	10,957	1,208,589	54,663	200,212	2,331,578
1943	293,065	275,187	149,067	140,651	11,054	1,222,322	55,303	203,491	2,350,140
1944	293,587	270,733	150,883	143,495	11,189	1,236,211	55,951	206,824	2,368,872
1945	295,617	270,385	152,699	147,445	11,420	1,249,529	56,685	210,314	2,394,093
1946	297,661	270,038	154,386	151,505	11,655	1,262,989	57,429	213,863	2,419,526
1947	299,719	269,691	157,396	155,676	11,896	1,276,595	58,183	217,472	2,446,628
1948	301,792	269,344	160,186	159,961	12,141	1,290,347	58,946	221,142	2,473,860
1949	303,879	268,998	163,380	164,365	12,392	1,304,248	59,720	224,874	2,501,856
1950	305,980	268,653	166,149	168,891	12,648	1,318,300	60,503	228,670	2,529,794
1951	307,614	272,668	169,056	173,470	12,971	1,346,675	62,045	233,277	2,577,776
1952	309,419	276,988	172,184	178,206	13,276	1,373,044	63,637	238,113	2,624,866
1953	311,318	281,512	175,204	183,079	13,572	1,398,327	65,275	243,178	2,671,465
1954	313,256	286,158	178,491	188,076	13,871	1,423,282	66,957	248,471	2,718,563
1955	315,210	290,859	181,811	193,194	14,177	1,448,502	68,683	253,995	2,766,430
1956	317,181	295,566	185,169	198,438	14,493	1,474,410	70,454	259,750	2,815,461
1957	319,198	300,248	188,783	203,821	14,819	1,501,266	72,274	265,739	2,866,148
1958	321,313	304,888	192,154	209,363	15,153	1,529,183	74,149	271,965	2,918,168
1959	323,589	309,482	195,508	215,088	15,490	1,558,162	76,087	278,432	2,971,839
1960	326,082	314,026	198,740	221,017	15,825	1,588,185	78,094	285,142	3,027,112
1961	328,811	318,510	202,131	227,158	16,158	1,619,315	80,176	292,100	3,084,358
1962	331,735	322,904	205,326	233,499	16,490	1,651,784	82,333	299,309	3,143,380
1963	334,747	327,158	208,381	240,004	16,830	1,686,032	84,565	306,772	3,204,489
1964	337,699	331,212	211,391	246,626	17,188	1,722,601	86,865	314,491	3,268,074
1965	340,483	335,028	214,161	253,328	17,571	1,761,816	89,234	322,471	3,334,092
1966	343,051	338,580	216,792	260,095	17,983	1,803,843	91,673	330,720	3,402,738
1967	345,426	341,894	219,309	266,935	18,417	1,848,407	94,191	339,248	3,473,827
1968	347,650	345,036	221,628	273,856	18,862	1,894,841	96,796	348,050	3,546,719
1969	349,796	348,104	223,902	280,878	19,300	1,942,208	99,503	357,120	3,620,809
1970	351,914	351,170	226,575	288,013	19,718	1,989,773	102,321	366,459	3,695,944
1971	354,017	354,257	229,458	295,261	20,114	2,037,374	105,261	376,067	3,771,809
1972	356,073	357,356	231,930	302,613	20,490	2,085,033	108,326	385,965	3,847,786
1973	358,042	360,470	234,186	310,058	20,846	2,132,442	111,523	396,199	3,923,766
1974	359,865	363,591	236,454	317,584	21,184	2,179,293	114,854	406,828	3,999,654
1975	361,500	366,715	238,909	325,181	21,507	2,225,401	118,326	417,898	4,075,437
1976	362,944	369,845	241,269	332,840	21,812	2,270,595	121,930	429,425	4,150,660
1977	364,217	372,988	243,740	340,560	22,102	2,314,988	125,672	441,404	4,225,672
1978	365,342	376,138	246,795	348,351	22,388	2,359,059	129,593	453,835	4,301,501
1979	366,351	379,292	249,506	356,224	22,685	2,403,493	133,746	466,707	4,378,004
1980	367,275	382,440	252,495	364,185	23,005	2,448,821	138,161	480,012	4,456,394
1981	368,120	385,557	255,041	372,237	23,352	2,495,041	142,847	493,748	4,535,942
1982	368,901	388,629	257,563	380,367	23,722	2,542,085	147,771	507,910	4,616,948
1983	369,663	391,673	259,934	388,551	24,113	2,590,313	152,871	522,486	4,699,604
1984	370,464	394,718	262,218	396,755	24,518	2,640,146	158,063	537,454	4,784,334
1985	371,346	397,767	264,573	404,954	24,929	2,691,792	163,275	552,796	4,871,434
1986	372,324	400,838	267,019	413,133	25,348	2,745,457	168,496	568,506	4,961,120
1987	373,394	403,877	269,522	421,293	25,775	2,800,813	173,717	584,569	5,052,960
1988	374,565	406,719	272,089	429,447	26,207	2,856,866	178,884	600,957	5,145,733
1989	375,840	409,150	274,898	437,617	26,640	2,912,259	183,933	617,632	5,237,968
1990	377,214	411,019	278,107	445,815	27,071	2,965,984	188,823	634,567	5,328,602
1991	378,716	412,273	281,805	454,042	27,501	3,017,694	193,523	651,763	5,417,317
1992	380,332	412,962	285,546	462,279	27,929	3,067,558	198,051	669,221	5,503,880
1993	381,976	413,168	289,226	470,499	28,353	3,115,740	202,480	686,917	5,588,359
1994	383,529	413,018	292,727	478,668	28,772	3,162,600	206,913	704,821	5,671,048
1995	384,913	412,621	296,155	486,755	29,185	3,208,430	211,426	722,922	5,752,408
1996	386,083	412,005	299,577	494,759	29,593	3,253,187	216,059	741,221	5,832,484
1997	387,083	411,180	303,122	502,678	29,997	3,296,803	220,798	759,753	5,911,415
1998	388,043	410,215	306,579	510,489	30,401	3,339,543	225,607	778,592	5,989,470
1999	389,145	409,185	310,008	518,163	30,811	3,381,745	230,431	797,836	6,067,325

2000	390,517	408,158	313,341	525,686	31,229	3,423,661	235,236	817,566	6,145,394
2001	392,191	407,166	316,361	533,042	31,657	3,465,426	239,997	837,821	6,223,661
2002	394,116	406,240	319,367	540,245	32,094	3,507,017	244,751	858,623	6,302,453
2003	396,235	405,427	322,341	547,350	32,552	3,548,330	249,606	880,017	6,381,858
2004	398,456	404,780	325,342	554,433	33,040	3,589,182	254,706	902,049	6,461,988
2005	400,700	404,333	328,362	561,548	33,568	3,629,452	260,146	924,758	6,542,867
2006	402,968	404,109	331,399	568,711	34,138	3,669,091	265,966	948,156	6,624,538
2007	405,254	404,104	334,450	575,906	34,747	3,708,181	272,109	972,266	6,707,018
2008	407,469	404,301	337,267	583,116	35,380	3,746,887	278,461	997,145	6,790,025
2009	409,504	404,668	341,084	590,307	36,014	3,785,433	284,855	1,022,859	6,874,725
2010	411,287	405,174	344,295	597,455	36,636	3,823,963	291,164	1,049,446	6,959,421
2011	412,770	405,813	347,080	604,556	37,238	3,862,526	297,349	1,076,934	7,044,266
2012	413,978	406,573	349,900	611,608	37,824	3,901,016	303,426	1,105,285	7,129,609
2013	415,002	407,399	352,644	618,594	38,399	3,939,225	309,387	1,134,398	7,215,047
2014	415,977	408,227	355,348	625,489	38,970	3,976,864	315,243	1,164,130	7,300,248
2015	417,001	409,003	357,980	632,276	39,543	4,013,708	320,998	1,194,370	7,384,880
2016	418,107	409,704	360,802	638,944	40,117	4,049,674	326,640	1,225,081	7,469,068
2017	419,261	410,323	361,444	645,488	40,691	4,084,766	332,152	1,256,268	7,550,393
2018	420,421	410,852	364,085	651,907	41,261	4,118,962	337,545	1,287,921	7,632,955
2019	421,520	411,292	366,602	658,201	41,826	4,152,264	342,834	1,320,039	7,714,577
2020	422,508	411,640	369,263	664,369	42,384	4,184,664	348,032	1,352,622	7,795,482

Table P.2 Population per country and total population of 72 countries 1820-2020 (000)

	1	2	3	4	5	6	7	8	9
	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy
	WE	WE	WE	WE	WE	WE	WE	WE	WE
1820	3,369	3,434	1,155	1,169	30,250	26,101	2,312	7,101	19,448
1830	3,538	3,750	1,273	1,364	32,370	29,393	2,534	7,827	21,607
1840	3,716	4,080	1,357	1,441	34,080	32,621	2,777	8,349	23,273
1850	3,950	4,449	1,499	1,628	35,630	35,312	3,044	6,878	24,771
1860	4,235	4,740	1,696	1,738	36,510	37,611	3,336	5,821	25,634
1870	4,520	5,096	1,888	1,754	36,870	40,805	3,657	5,419	27,203
1880	4,941	5,541	2,081	2,047	37,450	45,095	4,049	5,203	29,103
1890	5,394	6,096	2,294	2,364	38,380	49,241	4,482	4,718	30,967
1900	5,973	6,719	2,561	2,646	38,900	56,046	4,962	4,469	33,135
1910	6,614	7,498	2,882	2,929	39,540	64,568	5,320	4,385	35,443
1920	6,455	7,552	3,242	3,133	39,023	63,028	5,700	4,361	37,219
1930	6,684	8,076	3,542	3,449	41,610	65,084	6,351	2,927	40,085
1940	6,705	8,346	3,832	3,698	41,000	69,835	7,280	2,958	43,528
1950	6,935	8,639	4,271	4,009	41,836	68,375	7,566	2,913	46,792
1960	7,047	9,119	4,581	4,430	45,684	72,481	8,327	2,822	49,600
1970	7,467	9,638	4,929	4,606	50,772	77,783	8,793	2,950	53,316
1980	7,549	9,847	5,123	4,780	53,880	78,298	9,643	3,435	56,063
1990	7,723	9,969	5,141	4,986	56,735	79,380	10,130	3,569	56,719
2000	8,113	10,264	5,337	5,169	59,382	82,188	10,559	3,849	56,348
2010	8,410	10,753	5,555	5,366	63,027	82,302	10,888	4,627	59,190
2020	9,006	11,590	5,792	5,541	65,274	83,784	10,423	4,938	60,462

	10	11	12	13	14	15	16	17	18
	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	UK	Bulgaria	Czecho-slovakia
	WE	WE	WE	WE	WE	WE	WE	EE	EE
1820	2,333	970	3,297	12,203	2,585	1,986	21,239	2,187	7,657
1830	2,633	1,124	3,491	13,041	2,888	2,100	24,139	2,287	8,155
1840	2,886	1,241	3,704	13,937	3,139	2,220	26,745	2,391	8,685
1850	3,098	1,392	3,816	14,894	3,483	2,379	27,181	2,500	9,250
1860	3,318	1,596	4,073	15,645	3,860	2,510	28,888	2,543	9,692
1870	3,610	1,735	4,340	16,060	4,169	2,655	31,400	2,586	10,155
1880	4,034	1,919	4,630	16,713	4,566	2,839	34,623	2,985	10,690
1890	4,535	1,997	5,050	17,796	4,785	2,951	37,485	3,445	11,253
1900	5,133	2,230	5,423	18,594	5,136	3,300	41,155	4,000	12,142
1910	5,905	2,384	5,909	19,927	5,522	3,735	44,916	4,520	12,984
1920	6,810	2,635	6,033	21,303	5,904	3,877	46,821	5,072	12,979
1930	7,881	2,807	6,826	23,564	6,142	4,051	45,866	6,027	13,964
1940	8,879	2,973	7,722	25,888	6,371	4,226	48,226	6,666	14,713
1950	10,114	3,265	8,441	27,976	7,042	4,694	50,127	7,251	12,389
1960	11,487	3,581	8,851	30,431	7,498	5,362	52,372	7,867	13,654
1970	13,038	3,877	8,569	33,824	8,081	6,267	55,632	8,490	14,319
1980	14,150	4,086	9,853	37,272	8,318	6,385	56,314	8,879	15,255
1990	14,952	4,242	9,863	39,102	8,591	6,837	57,493	8,841	15,572
2000	15,926	4,492	10,150	40,288	8,883	7,267	59,522	7,998	15,670
2010	16,683	4,886	10,573	46,077	9,378	7,832	63,307	7,405	15,941
2020	17,135	5,421	10,197	46,755	10,099	8,655	67,886	6,948	16,169

	19	20	21	22	23	24	25	26	27
	Hungary	Poland	Romania	Yugoslavia	F. USSR	Canada	USA	Argentina	Bolivia
	EE	EE	EE	EE	EE	NA	NA	LA	LA
1820	4,146	10,426	6,389	5,215	54,765	446	9,981	534	1,100
1830	4,460	11,222	6,886	5,465	60,477	788	13,240	679	1,185
1840	4,798	12,078	7,422	5,726	66,784	1,133	17,444	865	1,276
1850	5,161	13,000	8,000	6,000	73,750	2,086	23,580	1,100	1,374
1860	5,526	14,839	8,569	7,036	80,867	3,089	31,839	1,406	1,433
1870	5,917	16,865	9,179	8,252	88,672	3,625	40,241	1,796	1,495
1880	6,260	19,632	9,758	8,942	99,059	4,255	50,458	2,463	1,528
1890	6,622	22,854	10,373	9,690	110,664	4,779	63,302	3,378	1,562
1900	7,127	24,750	11,000	11,174	124,500	5,301	76,391	4,632	1,596
1910	7,644	26,644	11,866	13,052	148,227	6,988	92,767	6,832	1,758
1920	7,950	23,968	12,340	12,422	154,607	8,556	106,881	9,012	1,930
1930	8,649	28,204	14,141	14,407	174,212	10,208	123,668	12,106	2,164
1940	9,287	30,021	15,907	16,300	195,970	11,381	132,637	14,236	2,434
1950	9,338	24,824	16,311	16,298	179,571	13,712	152,271	17,150	2,714
1960	9,984	29,590	18,403	18,133	213,780	17,870	180,671	20,616	3,351
1970	10,337	32,526	20,253	19,840	242,478	21,297	205,052	23,962	4,212
1980	10,711	35,578	22,612	21,615	265,936	24,516	227,726	28,094	5,355
1990	10,378	38,119	23,489	22,720	287,751	27,698	250,132	32,581	6,669
2000	10,221	38,550	22,128	22,319	287,503	30,689	282,339	36,896	8,317
2010	9,928	38,323	20,440	21,820	288,167	33,913	310,038	40,738	10,031
2020	9,660	37,847	19,238	20,914	300,517	37,742	331,003	45,196	11,673

	28	29	30	31	32	33	34	35	36
	Brazil	Chile	Colombia	Costa Rica	Cuba	Dominican Rep.	Ecuador	El Salvador	Guatemala
	LA	LA	LA	LA	LA	LA	LA	LA	LA
1820	4,507	771	1,206	63	605	89	500	248	595
1830	5,277	965	1,443	74	757	105	589	282	670
1840	6,178	1,181	1,726	86	948	124	693	321	755
1850	7,234	1,410	2,065	101	1,186	146	816	366	850
1860	8,418	1,661	2,222	118	1,256	188	909	424	958
1870	9,797	1,943	2,392	137	1,331	242	1,013	492	1,080
1880	12,131	2,274	2,867	191	1,449	333	1,122	612	1,051
1890	15,021	2,631	3,437	268	1,578	459	1,242	761	1,023
1900	18,599	2,959	4,120	374	1,719	633	1,376	946	996
1910	22,984	3,336	5,094	435	2,385	781	1,503	1,171	1,232
1920	28,343	3,785	6,450	507	3,223	929	1,630	1,384	1,422
1930	34,725	4,365	7,869	604	3,922	1,330	2,053	1,703	1,970
1940	42,524	5,063	9,638	749	4,609	1,858	2,614	1,928	2,463
1950	53,975	6,082	12,000	966	5,920	2,365	3,387	2,200	3,146
1960	72,744	7,643	16,005	1,334	7,141	3,294	4,439	2,773	4,140
1970	95,991	9,570	21,327	1,821	8,710	4,502	5,970	3,740	5,419
1980	121,618	11,174	26,881	2,347	9,823	5,808	7,961	4,660	7,014
1990	149,527	13,179	33,186	3,076	10,564	7,179	10,272	5,326	8,908
2000	174,167	15,398	39,763	3,929	11,075	8,560	12,305	5,942	11,229
2010	195,498	17,094	46,299	4,590	11,203	9,899	14,700	6,192	14,376
2020	212,559	19,116	50,883	5,094	11,327	10,848	17,643	6,486	17,916

	37	38	39	40	41	42	43	44	45
	Haïti	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
	LA	LA	LA	LA	LA	LA	LA	LA	LA
1820	723	135	6,587	186	1	143	1,317	55	718
1830	789	185	6,927	218	5	193	1,514	74	880
1840	860	255	7,285	256	26	260	1,741	99	1,080
1850	938	350	7,662	300	135	350	2,001	132	1,324
1860	1,039	376	8,404	318	154	367	2,284	213	1,479
1870	1,150	404	9,219	337	176	384	2,606	343	1,653
1880	1,163	415	10,756	388	205	424	2,692	486	1,900
1890	1,175	426	12,548	446	240	468	2,781	689	2,184
1900	1,188	437	14,640	513	280	516	2,873	977	2,511
1910	1,606	572	16,307	660	355	652	3,830	1,150	2,665
1920	2,014	749	15,220	782	484	737	4,625	1,506	2,890
1930	2,299	988	17,802	831	505	926	5,410	1,761	3,198
1940	2,689	1,196	21,137	1,014	667	1,168	6,397	2,005	3,803
1950	3,221	1,487	27,741	1,295	860	1,473	7,632	2,239	5,094
1960	3,869	2,003	37,877	1,774	1,126	1,907	9,931	2,538	7,579
1970	4,713	2,691	52,030	2,399	1,506	2,484	13,193	2,808	10,721
1980	5,691	3,634	69,361	3,250	1,949	3,198	17,324	2,914	15,091
1990	7,109	4,901	85,358	4,137	2,411	4,248	21,765	3,106	19,731
2000	8,578	6,234	101,720	5,100	2,950	5,303	25,997	3,318	24,402
2010	10,089	7,600	114,093	5,822	3,643	6,210	29,495	3,372	29,043
2020	11,403	9,905	128,933	6,625	4,315	7,133	32,972	3,474	28,436

	46	47	48	49	50	51	52	53	54
	Australia	N, Zealand	China	India	Indonesia	Japan	Malaysia	Philippines	Thailand
	O	O	As	As	As	As	As	As	As
1820	334	100	381,000	209,000	17,927	31,000	287	2,176	4,665
1830	330	100	409,000	217,577	19,473	31,330	352	2,576	4,846
1840	420	70	412,000	226,505	21,153	31,663	432	3,051	5,034
1850	605	105	412,000	235,800	22,977	32,000	530	3,612	5,230
1860	1,326	132	377,000	244,249	25,779	33,196	651	4,276	5,496
1870	1,775	291	358,000	253,000	28,922	34,437	800	5,063	5,775
1880	2,197	520	368,000	257,200	32,876	36,807	1,126	5,726	6,206
1890	3,107	665	380,000	279,626	37,579	40,077	1,585	6,476	6,670
1900	3,741	807	400,000	284,500	42,746	44,103	2,232	7,324	7,320
1910	4,375	1,045	423,000	302,100	48,206	49,518	2,893	8,861	8,305
1920	5,358	1,241	472,000	305,600	53,723	55,818	3,545	10,725	9,802
1930	6,469	1,493	489,000	336,400	60,596	64,203	4,413	13,194	12,392
1940	7,042	1,636	518,770	386,800	70,175	72,967	5,434	16,585	15,513
1950	8,267	1,908	546,815	376,325	79,043	83,805	6,434	21,131	20,042
1960	10,361	2,372	667,070	449,481	95,254	94,092	8,428	28,529	27,513
1970	12,660	2,828	818,315	553,579	116,044	104,345	10,910	38,604	37,091
1980	14,616	3,170	981,235	696,784	147,490	116,807	13,764	50,940	47,026
1990	17,096	3,360	1,135,185	870,133	181,437	124,516	18,038	64,318	56,583
2000	19,164	3,859	1,262,645	1,053,051	211,540	127,534	23,186	77,992	62,958
2010	22,268	4,370	1,368,811	1,230,981	242,524	128,552	28,112	93,727	67,209
2020	25,500	4,822	1,439,324	1,380,004	273,524	126,476	32,366	109,581	69,800

	55	56	57	58	59	60	61	62	63
	Iran	Iraq	Israel	S. Arabia	Syria	Turkey	Algeria	Congo R.D.	Egypt
	ME	ME	ME	ME	ME	ME	Af	Af	Af
1820	6,560	1,093		2,091	1,337	10,074	2,689	5,000	4,194
1830	6,895	1,177		2,201	1,383	10,396	2,878	5,220	4,653
1840	7,247	1,267		2,317	1,430	10,729	3,080	5,449	5,162
1850	7,617	1,363		2,439	1,479	11,073	3,296	5,688	5,727
1860	8,006	1,468		2,567	1,530	11,427	3,528	6,115	6,354
1870	8,415	1,580		2,338	1,582	11,793	3,776	6,574	7,049
1880	8,955	1,776		2,620	1,669	12,471	4,121	7,067	8,000
1890	9,529	1,997		2,936	1,762	13,189	4,497	7,598	9,078
1900	10,140	2,244		3,290	1,859	13,948	4,907	8,102	10,302
1910	10,791	2,523		3,687	1,962	14,750	5,355	8,791	11,692
1920	11,852	2,972		2,872	2,217	14,205	6,021	9,538	13,494
1930	13,196	3,573		3,176	2,580	14,928	6,857	10,349	15,686
1940	14,691	4,295		3,513	3,003	17,821	7,809	11,229	18,235
1950	16,357	5,163	1,286	3,860	3,495	21,408	8,893	12,184	21,198
1960	21,577	6,822	2,141	4,718	4,533	27,472	10,909	15,248	26,847
1970	28,933	9,414	2,903	6,109	6,258	34,876	13,932	20,010	33,574
1980	39,583	13,233	3,737	9,999	8,774	43,976	18,806	26,357	42,634
1990	57,036	18,135	4,512	16,327	12,436	53,922	25,912	34,615	56,694
2000	66,132	22,676	6,014	20,764	16,411	63,240	31,184	47,076	69,906
2010	74,568	30,763	7,426	27,426	21,363	72,327	36,118	64,523	84,108
2020	83,993	40,223	8,656	34,814	17,501	84,339	43,851	89,561	102,334

	64	65	66	67	68	69	70	71	72	
	Eritrea & Ethiopia	Libya	Malawi	Morocco	Nigeria	South Africa	Tunisia	Zambia	Zimbabwe	TOTAL
	Af	Af	Af	Af	Af	Af	Af	Af	Af	
1820	3,154	538	820	2,689	16,356	1,550	875	800	744	967,300
1830	3,657	563	915	2,878	16,582	1,712	928	820	754	1,038,058
1840	4,240	588	1,021	3,080	17,771	1,891	985	841	780	1,086,245
1850	4,916	615	1,140	3,296	17,278	2,088	1,045	862	782	1,130,134
1860	5,699	643	1,161	3,528	17,624	2,306	1,108	924	807	1,145,738
1870	6,608	673	1,183	3,776	17,977	2,547	1,176	989	899	1,181,661
1880	7,661	703	1,205	4,051	18,338	3,127	1,310	1,060	945	1,257,061
1890	8,882	735	1,468	4,347	18,705	3,839	1,459	1,157	1,015	1,361,813
1900	10,298	769	1,789	4,664	19,080	4,713	1,625	1,264	1,065	1,467,487
1910	11,940	804	2,180	5,004	19,941	5,786	1,810	1,380	1,434	1,615,610
1920	13,844	841	2,324	5,729	23,407	7,149	2,107	1,609	1,703	1,735,190
1930	16,051	879	2,478	6,743	27,476	8,857	2,500	1,877	2,023	1,902,344
1940	18,609	919	2,642	7,938	32,253	10,973	2,965	2,189	2,402	2,108,950
1950	21,577	961	2,817	9,343	37,860	13,596	3,517	2,553	2,853	2,228,598
1960	25,783	1,338	3,450	12,423	45,138	17,417	4,149	3,254	4,011	2,666,040
1970	31,629	1,999	4,489	15,909	55,981	22,740	5,099	4,252	5,515	3,199,900
1980	38,605	3,065	6,129	19,487	73,461	29,252	6,443	5,700	7,170	3,819,214
1990	51,194	4,140	9,287	24,686	95,270	37,561	8,233	7,942	10,153	4,492,083
2000	69,930	5,115	11,376	28,850	122,352	45,728	9,699	10,531	12,222	5,117,473
2010	92,094	6,169	15,167	32,410	158,578	51,585	10,640	13,850	12,698	5,733,178
2020	118,510	6,871	19,130	36,911	206,140	59,309	11,819	18,384	14,863	6,303,533

Energy Consumption

World Consumption

Figure A.1 World total and per capita energy consumption 1820-2020 (Mtoe and Koe)

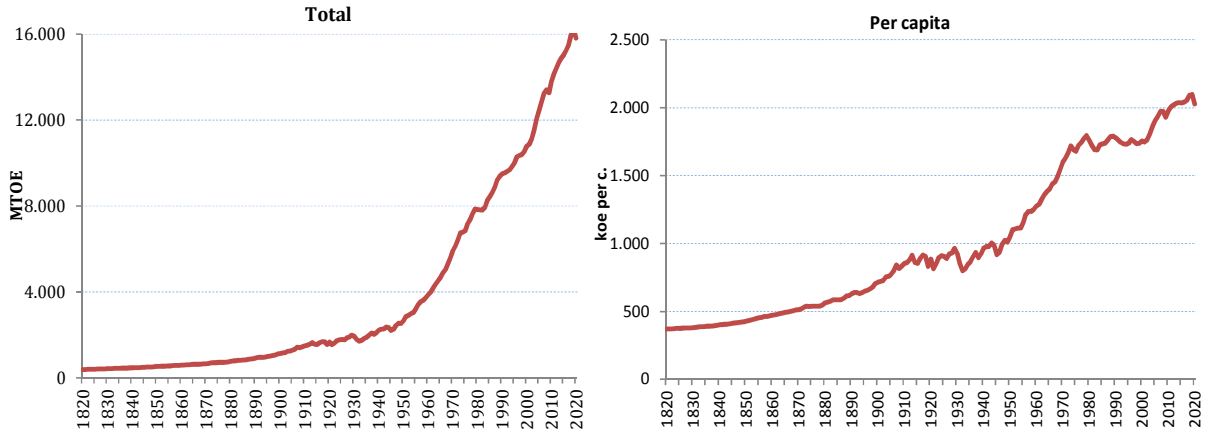


Figure A.2 Total energy consumption per macroarea 1820-2020 (Mtoe)(log vertical axis)

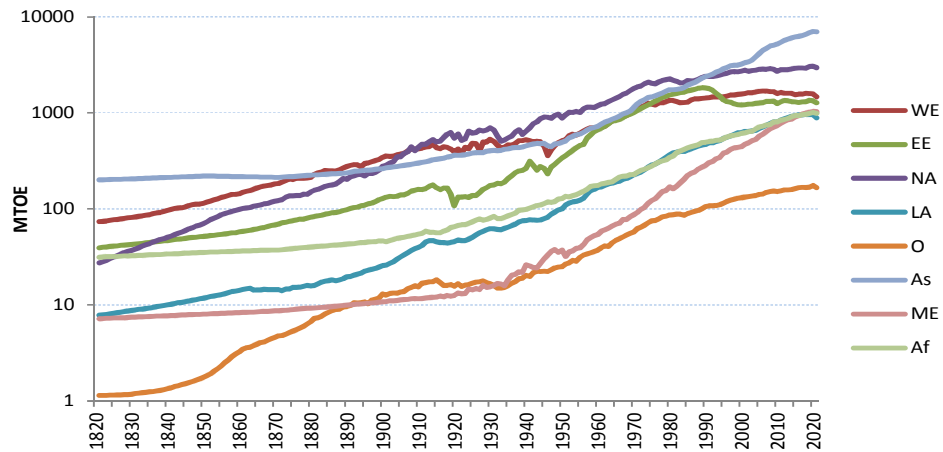


Table A.1 World energy consumption per macroarea 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	
	WE	EE	NA	LA	O	As	ME	Af	WORLD
1820	73.800	39.429	27.354	7.798	1.142	200.014	7.186	31.423	388.145
1821	74.333	39.794	28.257	7.895	1.142	200.665	7.213	31.547	390.847
1822	74.849	40.163	29.188	7.994	1.144	201.318	7.240	31.672	393.568
1823	75.961	40.610	30.289	8.095	1.147	201.973	7.268	31.796	397.138
1824	77.390	40.976	31.462	8.197	1.152	202.630	7.296	31.922	401.025
1825	77.583	41.343	32.653	8.301	1.157	203.289	7.323	32.048	403.697
1826	78.843	41.661	33.808	8.407	1.159	203.950	7.351	32.174	407.353
1827	79.940	42.046	35.026	8.514	1.162	204.614	7.379	32.301	410.982
1828	80.856	42.373	35.971	8.624	1.165	205.280	7.407	32.428	414.104
1829	81.372	42.687	36.990	8.735	1.171	205.948	7.435	32.556	416.894
1830	82.313	43.131	38.046	8.847	1.196	206.618	7.464	32.684	420.299
1831	83.515	43.439	39.275	8.962	1.207	207.284	7.492	32.813	423.988
1832	84.904	43.888	40.821	9.078	1.217	207.953	7.521	32.943	428.325
1833	85.965	44.274	42.234	9.197	1.232	208.624	7.549	33.073	432.148
1834	87.267	44.691	43.534	9.317	1.244	209.297	7.578	33.203	436.131
1835	89.578	45.102	45.115	9.442	1.257	209.973	7.607	33.334	441.407
1836	90.549	45.549	46.485	9.581	1.274	210.650	7.636	33.465	445.189

1837	92.117	45.974	47.919	9.723	1.291	211.330	7.665	33.597	449.615
1838	94.177	46.433	49.133	9.868	1.315	212.011	7.694	33.730	454.360
1839	96.015	46.905	50.546	10.017	1.343	212.695	7.723	33.863	459.108
1840	98.743	47.416	51.943	10.170	1.372	213.382	7.752	33.996	464.775
1841	100.667	47.899	53.716	10.338	1.410	214.069	7.782	34.130	470.013
1842	102.212	48.353	55.558	10.525	1.445	214.759	7.811	34.265	474.929
1843	103.133	48.738	57.459	10.659	1.477	215.452	7.841	34.400	479.159
1844	105.223	49.269	59.558	10.827	1.514	216.146	7.871	34.536	484.944
1845	108.434	49.862	61.777	11.002	1.555	216.843	7.901	34.672	492.046
1846	110.679	50.386	63.786	11.181	1.598	217.542	7.931	34.809	497.911
1847	112.337	50.846	65.994	11.375	1.647	218.243	7.961	34.946	503.348
1848	112.307	51.314	68.058	11.569	1.702	218.946	7.991	35.084	506.970
1849	114.485	51.657	70.513	11.771	1.768	219.652	8.022	35.222	513.090
1850	117.473	52.169	73.096	11.982	1.836	220.360	8.052	35.361	520.330
1851	120.385	52.669	77.359	12.197	1.914	219.990	8.080	35.473	528.067
1852	124.018	53.268	80.043	12.386	2.043	219.620	8.108	35.584	535.072
1853	127.473	53.821	83.184	12.602	2.168	219.251	8.136	35.697	542.332
1854	132.046	54.333	86.826	12.807	2.325	218.883	8.165	35.809	551.193
1855	134.607	55.074	89.708	13.039	2.503	218.515	8.193	35.922	557.562
1856	137.664	55.765	92.065	13.452	2.671	218.148	8.221	36.035	564.021
1857	141.469	56.384	94.105	13.760	2.881	217.781	8.250	36.149	570.778
1858	142.220	56.530	96.002	14.007	3.086	217.415	8.279	36.263	573.800
1859	143.550	57.542	98.752	14.173	3.243	217.049	8.307	36.378	578.995
1860	149.013	58.133	101.059	14.482	3.449	216.947	8.336	36.493	587.911
1861	152.279	59.072	101.906	14.723	3.572	216.563	8.365	36.576	593.057
1862	155.176	60.086	103.422	14.977	3.628	216.181	8.394	36.660	598.524
1863	160.249	61.105	106.613	14.246	3.784	215.800	8.423	36.744	606.963
1864	165.548	62.047	108.847	14.344	3.901	215.420	8.453	36.828	615.390
1865	169.823	63.271	109.891	14.379	4.070	215.043	8.526	36.913	621.916
1866	172.741	64.228	113.155	14.513	4.117	214.667	8.573	36.998	628.992
1867	175.284	65.647	114.233	14.402	4.324	214.292	8.608	37.083	633.874
1868	177.729	66.971	117.347	14.454	4.448	213.923	8.622	37.169	640.663
1869	182.123	68.135	120.516	14.447	4.598	213.554	8.679	37.255	649.308
1870	184.058	69.348	122.324	14.436	4.778	213.185	8.677	37.343	654.149
1871	189.555	71.567	125.013	14.102	4.792	214.341	8.750	37.646	665.767
1872	197.550	72.739	132.644	14.666	4.948	215.503	8.824	37.952	684.827
1873	205.982	74.155	137.289	14.640	5.162	216.672	8.884	38.261	701.045
1874	201.708	75.737	136.721	15.248	5.355	218.005	8.951	38.572	700.298
1875	208.118	76.591	138.230	15.215	5.533	219.465	9.041	38.886	711.080
1876	209.275	78.148	138.191	15.310	5.767	220.647	9.082	39.202	715.622
1877	208.992	78.308	142.592	15.619	6.007	221.813	9.196	39.521	722.048
1878	210.079	80.209	141.868	15.948	6.358	223.173	9.224	39.843	726.702
1879	212.626	81.924	150.495	15.764	6.709	224.542	9.228	40.167	741.454
1880	229.938	83.534	157.012	15.942	7.265	225.796	9.296	40.494	769.276
1881	237.407	84.615	159.604	16.671	7.365	226.954	9.373	40.755	782.743
1882	242.978	85.833	166.247	17.319	7.667	228.115	9.429	41.018	798.606
1883	251.090	88.399	172.147	17.609	8.066	229.279	9.497	41.282	817.368
1884	249.276	89.519	176.046	17.912	8.405	230.561	9.567	41.548	822.834
1885	249.519	91.177	177.402	18.250	8.760	231.805	9.639	41.816	828.368
1886	249.152	92.053	181.033	17.884	8.977	233.066	9.687	42.086	833.938
1887	256.901	93.577	193.771	18.280	9.061	234.512	9.788	42.357	858.248
1888	267.209	96.095	206.875	18.749	9.489	235.917	9.861	42.631	886.827
1889	275.505	98.238	203.047	19.604	9.629	237.435	9.970	42.818	896.245
1890	284.167	100.791	215.638	19.725	9.902	239.767	10.028	43.267	923.285
1891	289.526	103.441	222.154	20.422	10.552	246.140	10.112	43.588	945.934
1892	287.255	104.080	228.143	21.038	10.505	247.719	10.187	44.012	952.940
1893	275.307	107.715	229.183	21.391	10.548	249.372	10.266	44.505	948.287
1894	297.147	108.998	220.219	22.373	10.766	251.595	10.330	44.761	966.190
1895	301.152	112.704	233.343	22.843	10.300	253.244	10.399	45.215	989.200
1896	310.831	115.182	233.749	23.491	11.257	255.798	10.496	45.664	1,006.469
1897	321.007	119.121	240.099	23.975	11.507	257.721	10.534	45.525	1,029.487
1898	326.615	124.750	254.065	24.766	11.808	260.633	10.673	46.376	1,059.686

1899	344.076	127.963	278.148	25.630	12.983	262.263	10.794	46.430	1,108.286
1900	356.617	132.687	283.796	26.044	12.613	266.558	10.871	45.622	1,134.808
1901	351.518	135.075	299.682	27.153	13.127	271.658	11.032	46.826	1,156.071
1902	354.966	134.195	311.046	28.091	13.304	274.306	11.058	48.161	1,175.128
1903	366.845	135.630	349.553	29.858	13.227	277.127	11.157	49.416	1,232.813
1904	371.053	139.645	348.450	31.622	13.575	280.689	11.256	50.037	1,246.325
1905	377.064	139.724	378.581	33.226	13.831	283.328	11.361	50.800	1,287.914
1906	401.806	145.984	393.288	35.193	14.739	287.348	11.424	51.702	1,341.484
1907	420.782	153.518	444.824	37.133	15.226	291.325	11.572	52.852	1,427.233
1908	420.177	156.671	405.425	38.609	15.822	295.764	11.643	53.432	1,397.543
1909	424.091	160.025	438.260	39.733	15.456	298.757	11.626	54.588	1,442.534
1910	429.765	159.177	472.459	41.617	16.872	304.737	11.697	55.671	1,491.996
1911	440.046	163.138	470.155	45.381	17.094	308.777	11.804	58.686	1,515.081
1912	446.078	172.218	499.888	46.772	17.391	315.373	11.906	57.193	1,566.821
1913	476.422	177.621	528.840	46.767	17.441	325.117	12.015	57.127	1,641.351
1914	436.236	166.350	496.300	45.589	18.210	328.729	12.072	56.229	1,559.714
1915	423.170	158.915	508.492	44.542	17.029	332.317	12.386	56.365	1,553.216
1916	442.613	165.421	553.951	44.530	15.938	338.175	12.176	58.697	1,631.501
1917	439.123	165.008	600.920	44.097	15.949	347.083	12.560	60.155	1,684.894
1918	420.872	142.593	622.600	45.061	16.308	352.498	12.325	63.843	1,676.100
1919	393.437	107.637	545.746	45.617	15.685	362.585	12.544	65.497	1,548.747
1920	421.327	132.832	603.299	47.350	16.566	360.512	13.339	67.186	1,662.412
1921	378.491	132.665	519.289	46.857	15.590	362.705	13.025	68.608	1,537.230
1922	438.501	134.508	534.722	46.816	16.097	366.734	13.183	68.284	1,618.845
1923	424.641	131.694	644.164	48.467	16.251	373.981	14.608	70.887	1,724.692
1924	481.860	138.003	614.568	50.369	16.872	380.441	14.337	73.125	1,769.576
1925	476.729	138.107	623.528	53.682	17.305	384.854	14.813	76.341	1,785.359
1926	407.731	147.546	664.677	56.256	17.373	386.490	14.402	78.559	1,773.036
1927	496.600	160.211	649.530	58.403	17.711	385.352	16.099	75.956	1,859.863
1928	498.908	166.121	661.526	60.677	17.086	398.023	15.238	77.643	1,895.222
1929	531.529	175.979	698.494	62.444	16.600	403.536	15.485	80.216	1,984.284
1930	503.862	177.966	662.987	62.134	15.960	406.839	15.970	83.523	1,929.242
1931	461.744	185.744	572.207	61.025	14.941	405.287	16.779	79.062	1,796.789
1932	430.376	183.118	507.283	60.892	14.889	405.832	16.473	79.160	1,698.023
1933	437.648	190.658	519.633	62.823	15.192	417.091	15.867	81.880	1,740.792
1934	464.376	207.848	548.969	64.559	15.870	421.829	18.223	84.859	1,826.533
1935	463.626	221.074	574.984	66.957	16.825	431.214	20.456	87.768	1,882.904
1936	482.589	238.595	634.521	69.567	17.586	434.000	20.830	90.609	1,988.296
1937	515.649	248.375	669.247	73.076	18.755	436.392	22.140	96.883	2,080.516
1938	512.987	251.237	595.226	75.083	18.984	442.096	21.783	97.270	2,014.665
1939	524.765	263.042	641.616	75.555	20.338	452.112	26.157	98.972	2,102.558
1940	515.720	313.819	701.498	76.966	19.819	464.621	25.430	102.103	2,219.977
1941	502.211	283.744	774.168	76.537	21.649	474.869	24.449	104.624	2,262.250
1942	507.655	252.817	806.199	76.021	22.487	480.721	24.283	108.824	2,279.007
1943	499.973	275.914	870.190	76.915	22.356	477.612	26.994	109.883	2,359.835
1944	445.585	263.542	905.786	79.081	22.423	480.857	30.378	113.350	2,341.003
1945	358.602	232.070	898.504	82.036	22.264	455.694	32.969	117.999	2,200.138
1946	411.736	272.910	874.767	88.204	23.284	442.870	36.136	116.713	2,266.621
1947	456.856	291.748	936.235	92.743	24.259	473.301	37.821	119.251	2,432.214
1948	489.358	313.667	967.458	97.222	24.805	479.854	35.378	126.214	2,533.956
1949	514.835	340.774	883.483	100.270	24.980	495.416	37.194	127.917	2,524.868
1950	525.970	357.733	954.860	109.808	26.646	510.394	31.901	135.597	2,652.909
1951	581.388	383.408	1,018.145	114.875	27.472	548.565	35.791	133.537	2,843.181
1952	598.643	407.388	1,012.146	118.211	29.083	568.133	36.472	137.546	2,907.622
1953	588.774	431.996	1,036.215	119.689	28.519	592.965	38.828	140.680	2,977.667
1954	614.201	459.800	1,010.187	122.818	31.292	605.777	39.441	146.344	3,029.860
1955	645.875	468.424	1,102.092	129.517	33.002	627.578	42.574	152.269	3,201.331
1956	676.979	545.878	1,146.927	142.239	33.990	664.865	47.814	159.495	3,418.188
1957	699.678	593.241	1,147.366	155.706	34.797	690.586	50.405	172.496	3,544.275
1958	698.153	638.264	1,141.487	159.527	35.976	705.674	52.800	173.974	3,605.855
1959	697.608	668.523	1,192.529	167.090	37.238	726.186	54.340	175.884	3,719.398
1960	708.638	696.954	1,236.715	170.299	39.706	768.352	58.765	183.164	3,862.593

1961	730.049	726.817	1,253.483	176.390	41.183	803.669	60.773	185.300	3,977.664
1962	780.466	775.094	1,309.881	183.273	40.746	825.038	63.104	188.589	4,166.192
1963	824.211	825.010	1,360.978	185.373	44.364	858.473	66.280	191.101	4,355.791
1964	863.346	833.740	1,419.571	191.397	47.221	890.712	69.526	203.763	4,519.276
1965	891.209	855.112	1,480.547	193.713	48.925	924.951	70.810	214.746	4,680.013
1966	909.184	896.244	1,562.738	203.232	51.060	974.164	77.686	218.465	4,892.774
1967	938.581	936.209	1,613.022	207.807	53.404	1,002.553	77.506	219.853	5,048.935
1968	991.041	966.773	1,709.320	217.948	55.724	1,046.512	83.112	227.493	5,297.921
1969	1,047.891	1,010.961	1,795.759	226.701	57.681	1,139.347	86.907	227.618	5,592.866
1970	1,113.864	1,059.804	1,862.471	233.749	62.414	1,238.020	92.122	239.841	5,902.285
1971	1,150.420	1,109.245	1,904.474	242.211	64.542	1,320.120	99.089	251.540	6,141.642
1972	1,196.655	1,160.055	2,003.424	255.922	67.391	1,371.255	103.559	258.871	6,417.132
1973	1,266.859	1,216.255	2,088.669	272.477	71.545	1,446.589	114.589	269.811	6,746.795
1974	1,235.486	1,267.461	2,035.852	287.092	74.992	1,464.559	122.417	279.440	6,767.298
1975	1,210.420	1,330.403	2,003.012	293.268	75.780	1,506.018	127.449	293.407	6,839.756
1976	1,277.559	1,385.208	2,107.273	308.440	79.017	1,556.792	138.853	306.900	7,160.041
1977	1,272.711	1,443.773	2,171.505	323.679	82.796	1,610.085	151.803	316.817	7,373.170
1978	1,312.235	1,501.562	2,221.962	344.571	84.257	1,683.651	155.706	325.384	7,629.327
1979	1,354.451	1,539.444	2,258.610	365.624	86.658	1,744.680	170.294	344.598	7,864.359
1980	1,345.930	1,572.133	2,189.336	382.308	87.056	1,742.961	161.966	356.106	7,837.796
1981	1,307.385	1,585.566	2,132.966	388.309	88.167	1,757.442	171.703	384.720	7,816.259
1982	1,278.417	1,620.188	2,052.710	395.928	88.251	1,780.405	186.533	402.645	7,805.078
1983	1,284.051	1,646.601	2,066.733	396.750	85.939	1,836.971	203.311	418.170	7,938.526
1984	1,293.617	1,704.954	2,171.752	410.896	89.229	1,936.878	223.653	431.055	8,262.034
1985	1,361.348	1,722.584	2,157.855	423.930	91.600	2,006.343	235.052	444.591	8,443.303
1986	1,398.447	1,754.464	2,164.584	438.380	94.171	2,072.279	241.574	455.717	8,619.615
1987	1,401.290	1,802.759	2,234.498	448.895	96.399	2,174.259	260.894	466.792	8,885.786
1988	1,418.791	1,824.933	2,340.530	460.869	100.649	2,290.158	273.460	490.978	9,200.368
1989	1,424.280	1,814.169	2,397.754	468.608	105.350	2,391.244	283.831	493.341	9,378.578
1990	1,438.705	1,794.407	2,390.942	489.172	107.969	2,457.290	304.252	504.312	9,487.048
1991	1,468.790	1,724.888	2,387.641	488.165	107.484	2,543.898	312.238	507.927	9,541.031
1992	1,464.108	1,605.687	2,425.708	505.220	108.789	2,650.224	334.080	516.992	9,610.807
1993	1,463.296	1,490.630	2,481.212	513.926	110.728	2,757.130	344.922	521.951	9,683.797
1994	1,464.495	1,359.305	2,532.598	541.933	114.618	2,886.262	380.041	539.134	9,818.386
1995	1,492.706	1,313.504	2,581.496	557.637	119.765	2,987.825	390.544	561.601	10,005.076
1996	1,541.661	1,293.344	2,669.012	575.470	123.159	3,098.528	415.109	575.729	10,292.011
1997	1,538.870	1,238.746	2,687.630	599.676	126.371	3,144.720	433.764	588.036	10,357.813
1998	1,561.065	1,220.261	2,683.202	620.596	129.010	3,147.288	438.415	595.114	10,394.950
1999	1,567.492	1,207.417	2,726.056	624.320	131.207	3,234.404	444.370	612.191	10,547.457
2000	1,586.980	1,213.573	2,787.252	641.948	132.970	3,327.701	471.414	621.644	10,783.484
2001	1,620.496	1,230.482	2,719.778	641.728	134.147	3,404.620	487.619	637.370	10,876.240
2002	1,619.916	1,231.784	2,764.741	651.543	136.612	3,557.373	513.672	646.465	11,122.106
2003	1,654.857	1,257.453	2,782.087	657.378	137.783	3,829.415	529.835	679.943	11,528.749
2004	1,681.655	1,269.320	2,840.560	687.865	141.805	4,158.347	572.215	711.356	12,063.122
2005	1,687.539	1,278.061	2,855.406	712.861	142.602	4,464.720	598.397	727.087	12,466.673
2006	1,690.410	1,316.192	2,842.490	740.673	148.658	4,704.932	639.385	746.932	12,829.672
2007	1,667.907	1,322.994	2,899.412	774.583	152.008	4,984.678	678.754	759.720	13,240.056
2008	1,663.539	1,323.256	2,847.580	802.469	154.069	5,095.366	714.469	806.862	13,407.610
2009	1,587.699	1,248.808	2,718.781	799.548	151.152	5,224.317	735.836	805.503	13,271.645
2010	1,636.826	1,299.650	2,818.871	840.830	154.318	5,419.728	776.343	836.572	13,783.138
2011	1,595.350	1,342.539	2,817.017	864.656	157.977	5,699.985	815.540	854.474	14,147.538
2012	1,604.071	1,340.639	2,824.790	893.867	157.262	5,875.325	846.057	875.306	14,417.316
2013	1,597.481	1,311.929	2,881.724	920.800	159.252	6,038.738	859.998	911.247	14,681.169
2014	1,543.472	1,302.359	2,925.590	933.414	162.591	6,163.197	904.716	936.828	14,872.166
2015	1,569.626	1,281.109	2,937.643	955.592	166.469	6,256.833	932.727	940.701	15,040.700
2016	1,573.072	1,297.382	2,943.552	947.992	167.077	6,386.445	971.104	957.058	15,243.684
2017	1,598.798	1,310.462	2,917.853	961.286	167.618	6,592.280	999.402	970.901	15,518.600
2018	1,593.056	1,357.431	3,031.004	963.119	168.423	6,850.773	1,013.636	990.521	15,967.964
2019	1,576.912	1,340.608	3,056.986	959.615	175.081	7,027.271	1,039.349	1,011.280	16,187.102
2020	1,465.724	1,278.916	2,957.689	891.033	166.890	7,022.988	1,029.950	991.327	15,804.517

Decadal shares Consumption

Figure A.3 Percentage of total energy consumption per macroarea per year 1820-2020

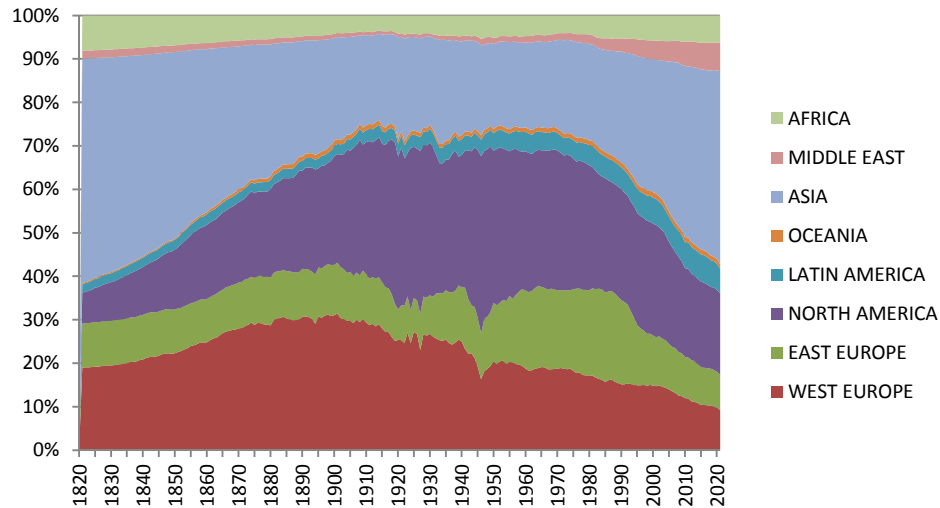


Table A.2 Percentage of World energy consumption per macroarea per decade 1820-2020

	1	2	3	4	5	6	7	8	
	WE	EE	NA	LA	O	As	ME	Af	WORLD
1820	19.01	10.16	7.05	2.01	0.29	51.53	1.85	8.10	100
1830	19.58	10.26	9.05	2.10	0.28	49.16	1.78	7.78	100
1840	21.25	10.20	11.18	2.19	0.30	45.91	1.67	7.31	100
1850	22.58	10.03	14.05	2.30	0.35	42.35	1.55	6.80	100
1860	25.35	9.89	17.19	2.46	0.59	36.90	1.42	6.21	100
1870	28.14	10.60	18.70	2.21	0.73	32.59	1.33	5.71	100
1880	29.89	10.86	20.41	2.07	0.94	29.35	1.21	5.26	100
1890	30.78	10.92	23.36	2.14	1.07	25.97	1.09	4.69	100
1900	31.43	11.69	25.01	2.30	1.11	23.49	0.96	4.02	100
1910	28.80	10.67	31.67	2.79	1.13	20.42	0.78	3.73	100
1920	25.34	7.99	36.29	2.85	1.00	21.69	0.80	4.04	100
1930	26.12	9.22	34.37	3.22	0.83	21.09	0.83	4.33	100
1940	23.23	14.14	31.60	3.47	0.89	20.93	1.15	4.60	100
1950	19.83	13.48	35.99	4.14	1.00	19.24	1.20	5.11	100
1960	18.35	18.04	32.02	4.41	1.03	19.89	1.52	4.74	100
1970	18.87	17.96	31.56	3.96	1.06	20.98	1.56	4.06	100
1980	17.17	20.06	27.93	4.88	1.11	22.24	2.07	4.54	100
1990	15.16	18.91	25.20	5.16	1.14	25.90	3.21	5.32	100
2000	14.72	11.25	25.85	5.95	1.23	30.86	4.37	5.76	100
2010	11.88	9.43	20.45	6.10	1.12	39.32	5.63	6.07	100
2020	9.27	8.09	18.71	5.64	1.06	44.44	6.52	6.27	100

World Consumption per source

Figure A.4 World energy consumption per source 1820-2020 (Mtoe)

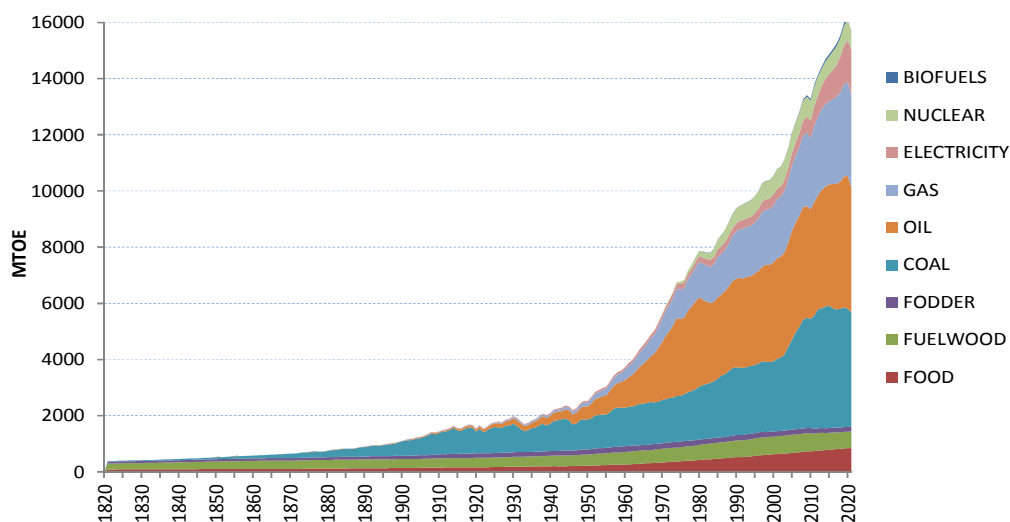


Table A.3 World energy consumption per source 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	85.654	209.733	67.894	24.865						388.145
1821	86.063	211.117	68.274	25.392						390.847
1822	86.599	212.542	68.685	25.742						393.568
1823	87.079	214.432	69.156	26.472						397.138
1824	87.672	216.422	69.668	27.263						401.025
1825	88.067	217.708	70.086	27.836						403.697
1826	88.679	219.619	70.627	28.428						407.353
1827	89.068	221.327	71.171	29.415						410.982
1828	89.514	223.015	71.511	30.065						414.104
1829	89.936	224.527	71.902	30.529						416.894
1830	90.362	226.199	72.374	31.364						420.299
1831	90.966	228.243	72.887	31.891						423.988
1832	91.541	230.218	73.477	33.089						428.325
1833	92.031	232.110	73.948	34.059						432.148
1834	92.554	234.133	74.499	34.945						436.131
1835	93.240	236.729	75.067	36.371						441.407
1836	93.397	238.264	75.410	38.118						445.189
1837	93.822	240.046	75.858	39.889						449.615
1838	94.441	242.183	76.473	41.263						454.360
1839	94.959	244.328	77.075	42.746						459.108
1840	95.790	246.539	77.717	44.729						464.775
1841	96.458	249.070	78.301	46.183						470.013
1842	96.982	251.772	78.911	47.264						474.929
1843	97.230	253.867	79.336	48.726						479.159
1844	97.737	256.245	79.941	51.021						484.944
1845	98.378	257.982	80.541	55.145						492.046
1846	98.930	260.343	81.100	57.538						497.911
1847	99.362	262.478	81.590	59.917						503.348
1848	99.913	264.765	82.140	60.153						506.970

1849	100.354	267.259	82.664	62.814					513.090
1850	100.927	269.831	83.166	66.405					520.330
1851	101.225	272.504	83.688	70.650					528.067
1852	101.380	274.531	83.975	75.187					535.072
1853	101.538	276.688	84.351	79.755					542.332
1854	101.523	278.640	84.678	86.352					551.193
1855	101.644	280.402	85.180	90.337					557.562
1856	102.017	282.473	85.672	93.859					564.021
1857	102.653	284.814	86.342	96.969					570.778
1858	103.162	286.758	86.894	96.985					573.800
1859	103.279	288.320	87.343	100.053					578.995
1860	103.666	289.903	87.720	106.546	0.077				587.911
1861	103.982	291.032	88.228	109.703	0.111				593.057
1862	104.403	292.424	88.333	113.197	0.167				598.524
1863	104.891	293.689	87.614	120.555	0.215				606.963
1864	105.161	294.965	87.522	127.470	0.271				615.390
1865	105.574	295.459	87.645	132.924	0.313				621.916
1866	105.590	296.026	87.657	139.345	0.375				628.992
1867	106.126	295.766	87.569	143.984	0.428				633.874
1868	106.403	296.216	87.714	149.852	0.478				640.663
1869	106.881	296.609	88.054	157.245	0.519				649.308
1870	107.064	296.862	88.395	161.243	0.585				654.149
1871	107.700	298.880	88.643	169.900	0.644				665.767
1872	108.541	300.898	89.734	185.018	0.635				684.827
1873	109.858	303.074	90.250	197.092	0.772				701.045
1874	110.333	303.984	91.269	193.911	0.800				700.298
1875	111.401	306.027	91.957	200.751	0.945				711.080
1876	112.446	307.508	92.656	201.459	1.552				715.622
1877	113.577	308.663	93.556	204.049	2.204				722.048
1878	114.534	309.715	94.423	205.388	2.641				726.702
1879	115.047	310.450	94.697	217.952	3.308				741.454
1880	116.199	312.013	95.421	241.789	3.854				769.276
1881	117.084	312.814	96.387	252.508	3.950				782.743
1882	117.943	313.774	97.526	265.414	3.856	0.092			798.606
1883	119.167	313.641	98.443	282.221	3.687	0.210			817.368
1884	120.311	314.230	99.235	284.431	3.978	0.650			822.834
1885	121.128	314.941	100.167	285.787	4.285	2.059			828.368
1886	121.742	315.678	100.593	288.081	4.903	2.942			833.938
1887	123.177	316.494	101.157	307.555	6.040	3.825			858.248
1888	123.917	316.511	102.028	332.557	7.106	4.708	0.000		886.827
1889	124.953	316.435	102.943	338.458	7.864	5.591	0.000		896.245
1890	125.776	316.319	105.091	359.984	9.086	6.474	0.555		923.285
1891	126.781	316.480	111.342	374.672	10.002	5.921	0.735		945.934
1892	128.609	316.506	112.408	378.769	10.304	5.369	0.975		952.940
1893	128.780	316.408	112.988	372.612	11.390	4.816	1.293		948.287
1894	130.643	316.759	113.795	387.939	11.076	4.264	1.715		966.190
1895	131.405	315.975	113.972	408.859	13.004	3.711	2.275		989.200
1896	133.093	316.271	115.326	421.105	13.641	4.242	2.790		1,006.469
1897	133.828	316.662	115.333	440.471	14.995	4.773	3.425		1,029.487
1898	135.269	317.154	116.128	464.272	17.356	5.304	4.203		1,059.686
1899	136.577	317.451	116.860	509.211	17.195	5.835	5.158		1,108.286
1900	137.759	315.922	119.213	529.041	20.155	6.367	6.351		1,134.808
1901	139.259	315.119	121.697	544.641	21.336	7.071	6.949		1,156.071
1902	141.383	316.357	123.086	555.571	23.618	7.532	7.582		1,175.128
1903	142.700	316.832	124.901	606.349	25.764	7.993	8.274		1,232.813
1904	144.355	317.116	126.882	611.661	28.943	8.318	9.049		1,246.325
1905	145.514	317.844	128.148	648.389	28.774	9.375	9.870		1,287.914
1906	146.733	320.005	129.910	695.252	28.667	10.352	10.564		1,341.484
1907	148.582	322.233	132.168	766.272	35.737	10.894	11.348		1,427.233
1908	149.949	324.375	134.225	727.897	38.176	10.760	12.161		1,397.543
1909	151.753	326.504	136.270	761.806	40.305	12.874	13.021		1,442.534
1910	153.842	329.551	141.750	795.273	43.999	13.606	13.975		1,491.996

1911	155.607	330.339	145.969	808.504	46.064	14.025	14.574		1,515.081	
1912	157.007	331.678	146.409	854.785	46.297	15.391	15.254		1,566.821	
1913	158.302	333.082	150.032	917.815	50.017	16.184	15.919		1,641.351	
1914	158.709	333.955	148.289	833.098	52.514	16.479	16.671		1,559.714	
1915	159.309	335.288	151.976	814.923	56.689	17.487	17.542		1,553.216	
1916	159.742	335.517	151.355	885.923	59.924	20.990	18.051		1,631.501	
1917	160.196	336.285	155.298	926.253	66.150	22.122	18.591		1,684.894	
1918	160.608	336.189	158.661	913.752	67.751	19.953	19.186		1,676.100	
1919	161.593	335.718	159.648	778.436	73.159	20.524	19.669		1,548.747	
1920	163.204	335.460	160.277	874.837	87.483	20.936	20.214		1,662.412	
1921	164.459	334.982	160.080	750.374	90.039	17.332	19.965		1,537.230	
1922	166.123	336.039	160.399	814.454	101.469	20.541	19.820		1,618.845	
1923	168.671	337.583	160.762	887.339	123.338	26.925	20.075		1,724.692	
1924	171.109	339.192	161.005	921.702	126.061	30.470	20.037		1,769.576	
1925	173.648	342.099	161.274	912.237	143.443	32.218	20.440		1,785.359	
1926	176.526	343.068	162.445	881.231	152.904	35.423	21.438		1,773.036	
1927	178.689	345.090	160.038	953.384	161.270	38.885	22.507		1,859.863	
1928	180.464	347.410	160.193	965.391	175.935	42.232	23.598		1,895.222	
1929	183.198	350.334	161.604	1,018.103	194.274	51.568	25.203		1,984.284	
1930	185.051	352.218	166.486	936.581	210.374	52.678	25.851		1,929.242	
1931	186.650	354.076	162.755	824.946	195.445	46.858	26.059		1,796.789	
1932	188.364	354.184	163.543	739.899	181.044	44.561	26.428		1,698.023	
1933	187.200	356.040	168.840	766.794	189.356	45.171	27.391		1,740.792	
1934	190.688	358.062	163.885	834.873	199.379	51.114	28.532		1,826.533	
1935	192.310	360.128	165.604	854.784	224.528	55.566	29.984		1,882.904	
1936	194.372	362.017	167.064	927.583	243.750	62.423	31.088		1,988.296	
1937	196.561	365.030	166.904	987.844	262.393	69.043	32.742		2,080.516	
1938	198.881	367.736	164.946	918.552	264.147	66.832	33.573		2,014.665	
1939	200.561	373.771	164.170	972.600	284.510	71.898	35.048		2,102.558	
1940	202.338	376.029	165.655	1,067.194	296.126	77.081	35.555		2,219.977	
1941	199.162	381.473	165.665	1,086.500	312.452	78.866	38.132		2,262.250	
1942	199.813	387.278	165.423	1,104.101	295.605	84.897	41.890		2,279.007	
1943	200.288	386.975	164.968	1,155.499	312.979	94.010	45.116		2,359.835	
1944	201.146	385.640	163.967	1,081.540	359.476	101.564	47.670		2,341.003	
1945	203.198	392.383	172.485	916.917	356.375	107.009	51.771		2,200.138	
1946	208.986	389.851	166.706	953.846	385.236	110.400	51.596		2,266.621	
1947	212.928	395.345	177.832	1,045.517	424.208	122.023	54.361		2,432.214	
1948	216.638	396.701	182.244	1,074.111	471.074	137.433	55.755		2,533.956	
1949	219.514	402.306	176.379	1,056.943	466.757	146.507	56.462		2,524.868	
1950	222.720	406.258	181.201	1,098.195	518.131	168.238	58.166		2,652.909	
1951	228.131	409.098	191.419	1,173.162	581.849	197.502	62.020		2,843.181	
1952	233.142	412.981	193.215	1,183.239	607.966	212.302	64.775		2,907.622	
1953	237.477	416.665	193.121	1,198.405	642.706	224.636	64.658		2,977.667	
1954	242.847	419.550	193.994	1,186.820	682.559	238.441	65.648		3,029.860	
1955	247.868	422.405	192.805	1,247.404	762.326	260.212	68.310		3,201.331	
1956	252.642	431.409	202.823	1,353.998	822.874	281.673	72.738	0.031	3,418.188	
1957	253.789	435.091	203.874	1,401.159	864.772	307.444	78.020	0.126	3,544.275	
1958	259.272	440.216	197.587	1,381.084	910.152	333.279	84.123	0.142	3,605.855	
1959	265.220	446.514	196.781	1,368.592	982.412	373.259	86.182	0.438	3,719.398	
1960	266.034	449.165	210.506	1,384.211	1,053.698	404.866	93.271	0.842	3,862.593	
1961	273.664	451.475	206.787	1,393.182	1,121.665	433.244	96.330	1.317	3,977.664	
1962	283.987	454.053	194.805	1,436.087	1,217.598	473.188	104.589	1.886	4,166.192	
1963	290.876	457.149	196.259	1,477.569	1,312.407	511.189	107.329	3.013	4,355.791	
1964	298.780	460.952	197.153	1,469.542	1,417.779	557.783	112.675	4.611	4,519.276	
1965	305.419	464.404	193.448	1,487.750	1,513.652	584.951	123.181	7.209	4,680.013	
1966	312.771	468.998	198.269	1,500.622	1,635.695	636.563	130.118	9.738	4,892.774	
1967	318.608	472.617	198.658	1,482.689	1,745.820	681.453	137.123	11.966	5,048.935	
1968	326.042	479.038	199.220	1,494.772	1,900.257	741.651	142.227	14.715	5,297.921	
1969	336.370	484.224	197.574	1,535.027	2,056.274	811.964	153.662	17.770	5,592.866	
1970	344.280	488.399	201.647	1,558.100	2,247.268	881.182	159.128	21.970	0.311	5,902.285
1971	352.493	490.938	205.853	1,567.977	2,383.187	942.194	168.009	30.614	0.378	6,141.642
1972	359.518	496.387	203.002	1,584.434	2,565.854	991.838	173.990	41.651	0.458	6,417.132

1973	367.949	499.960	203.882	1,625.903	2,781.594	1,035.245	176.002	55.705	0.556	6,746.795
1974	372.105	503.345	204.566	1,620.795	2,741.288	1,057.806	193.559	73.160	0.674	6,767.298
1975	389.715	504.439	196.556	1,675.461	2,722.809	1,054.014	195.809	100.135	0.818	6,839.756
1976	398.832	511.773	194.357	1,726.367	2,897.293	1,116.907	193.448	120.071	0.993	7,160.041
1977	397.542	517.288	197.364	1,773.463	3,008.397	1,145.657	187.146	145.110	1.205	7,373.170
1978	406.495	525.403	197.534	1,797.435	3,128.672	1,193.989	208.804	169.534	1.462	7,629.327
1979	427.388	531.491	196.607	1,879.937	3,172.595	1,262.200	217.902	174.466	1.774	7,864.359
1980	434.024	542.078	185.079	1,927.056	3,050.006	1,279.170	223.016	195.200	2.166	7,837.796
1981	442.194	546.955	187.915	1,947.416	2,935.801	1,295.932	227.213	230.226	2.607	7,816.259
1982	450.962	551.646	185.651	1,976.179	2,841.051	1,294.883	247.817	253.033	3.855	7,805.078
1983	459.828	561.422	188.165	2,022.109	2,822.636	1,333.930	264.701	280.261	5.474	7,938.526
1984	473.291	566.560	182.298	2,088.463	2,893.314	1,439.453	272.427	338.577	7.650	8,262.034
1985	480.879	571.485	183.305	2,201.161	2,877.296	1,450.989	268.865	401.126	8.197	8,443.303
1986	490.959	572.908	184.222	2,231.473	2,958.671	1,464.495	277.499	431.765	7.624	8,619.615
1987	504.925	574.345	186.795	2,322.819	3,011.429	1,539.052	274.638	463.394	8.390	8,885.786
1988	516.010	583.931	187.629	2,403.740	3,108.081	1,608.238	277.050	507.087	8.601	9,200.368
1989	526.812	591.729	189.065	2,417.211	3,149.251	1,682.722	291.242	521.840	8.707	9,378.578
1990	528.103	589.132	190.978	2,399.802	3,204.474	1,730.857	302.256	533.741	7.706	9,487.048
1991	530.156	594.714	191.457	2,390.073	3,184.192	1,775.921	309.010	557.485	8.023	9,541.031
1992	539.734	603.054	200.465	2,390.797	3,215.613	1,782.858	306.777	563.391	8.118	9,610.807
1993	553.437	606.129	200.337	2,410.888	3,193.859	1,797.953	326.367	586.112	8.714	9,683.797
1994	567.684	615.070	200.524	2,429.228	3,259.235	1,809.553	328.424	599.178	9.488	9,818.386
1995	582.799	620.949	200.294	2,450.132	3,292.631	1,868.598	353.811	625.897	9.965	10,005.076
1996	592.654	626.399	201.125	2,517.387	3,368.296	1,965.376	363.984	647.197	9.594	10,292.011
1997	603.719	623.965	186.336	2,511.460	3,453.150	1,949.734	374.153	645.336	9.958	10,357.813
1998	615.896	623.949	186.650	2,481.376	3,468.643	1,980.249	375.377	652.651	10.157	10,394.950
1999	625.218	628.272	186.552	2,491.874	3,525.545	2,028.625	379.973	671.072	10.326	10,547.457
2000	636.853	632.939	183.977	2,571.800	3,579.201	2,103.174	381.389	683.890	10.261	10,783.484
2001	646.105	626.428	184.654	2,611.203	3,602.935	2,127.905	367.446	699.602	9.961	10,876.240
2002	656.460	628.635	185.922	2,716.359	3,630.773	2,189.227	390.565	711.607	12.557	11,122.106
2003	665.777	633.622	185.468	2,968.186	3,722.682	2,248.795	401.237	688.752	14.230	11,528.749
2004	677.940	639.870	185.401	3,198.263	3,867.716	2,321.115	433.880	721.977	16.961	12,063.122
2005	690.159	645.871	177.432	3,453.507	3,913.072	2,382.042	462.210	722.038	20.344	12,466.673
2006	701.417	646.461	176.652	3,647.602	3,961.193	2,442.617	495.916	732.251	25.563	12,829.672
2007	716.119	644.543	184.399	3,870.054	4,007.944	2,543.212	524.971	715.066	33.749	13,240.056
2008	729.739	645.886	184.678	3,923.448	3,981.443	2,604.369	584.106	708.239	45.703	13,407.610
2009	728.588	649.563	183.297	3,890.770	3,895.879	2,544.976	622.266	704.042	52.264	13,271.645
2010	743.862	611.318	172.783	4,038.021	4,029.980	2,723.223	686.087	718.200	59.663	13,783.138
2011	757.317	621.206	172.751	4,237.708	4,055.491	2,809.421	753.636	677.347	62.662	14,147.538
2012	769.503	616.994	172.499	4,270.651	4,204.617	2,880.830	818.502	618.952	64.768	14,417.316
2013	780.206	601.889	172.303	4,332.681	4,273.327	2,931.118	893.915	625.608	70.122	14,681.169
2014	792.966	601.132	172.134	4,346.865	4,324.854	2,964.127	961.201	633.694	75.193	14,872.166
2015	804.122	600.715	170.773	4,245.070	4,424.723	3,016.331	1,045.371	655.673	77.924	15,040.700
2016	811.190	590.576	168.727	4,203.715	4,486.942	3,096.373	1,135.971	668.341	81.848	15,243.684
2017	821.857	585.277	170.051	4,220.250	4,524.163	3,181.070	1,256.373	676.196	83.364	15,518.600
2018	832.404	591.747	171.313	4,262.541	4,660.539	3,287.284	1,377.630	694.595	89.910	15,967.964
2019	841.847	588.513	164.465	4,210.403	4,726.068	3,340.833	1,499.835	718.437	96.702	16,187.102
2020	850.115	595.041	166.243	4,065.201	4,449.084	3,282.598	1,617.525	686.266	92.442	15,804.517

Shares per source Consumption

Figure A.5 Percentage of any source on total World consumption 1820-2020

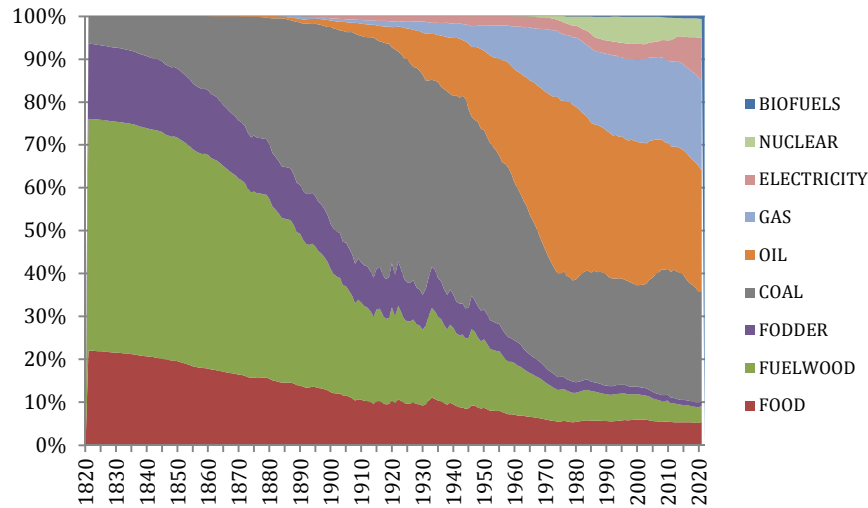


Table A.4 Percentage of any source on World energy consumption per decade 1820-2020

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	22.07	54.03	17.49	6.41						100
1830	21.50	53.82	17.22	7.46						100
1840	20.61	53.04	16.72	9.62						100
1850	19.40	51.86	15.98	12.76						100
1860	17.63	49.31	14.92	18.12	0.01					100
1870	16.37	45.38	13.51	24.65	0.09					100
1880	15.10	40.56	12.40	31.43	0.50					100
1890	13.62	34.26	11.38	38.99	0.98	0.70	0.06			100
1900	12.14	27.84	10.51	46.62	1.78	0.56	0.56			100
1910	10.31	22.09	9.50	53.30	2.95	0.91	0.94			100
1920	9.82	20.18	9.64	52.62	5.26	1.26	1.22			100
1930	9.59	18.26	8.63	48.55	10.90	2.73	1.34			100
1940	9.11	16.94	7.46	48.07	13.34	3.47	1.60			100
1950	8.40	15.31	6.83	41.40	19.53	6.34	2.19			100
1960	6.89	11.63	5.45	35.84	27.28	10.48	2.41	0.02		100
1970	5.83	8.27	3.42	26.40	38.07	14.93	2.70	0.37	0.01	100
1980	5.54	6.92	2.36	24.59	38.91	16.32	2.85	2.49	0.03	100
1990	5.57	6.21	2.01	25.30	33.78	18.24	3.19	5.63	0.08	100
2000	5.91	5.87	1.71	23.85	33.19	19.50	3.54	6.34	0.10	100
2010	5.40	4.44	1.25	29.30	29.24	19.76	4.98	5.21	0.43	100
2020	5.38	3.77	1.05	25.72	28.15	20.77	10.23	4.34	0.58	100

Western Europe Consumption

Figure A.6 Total and per capita energy consumption per source in Western Europe 1820-2020 (Mtoe and koe)

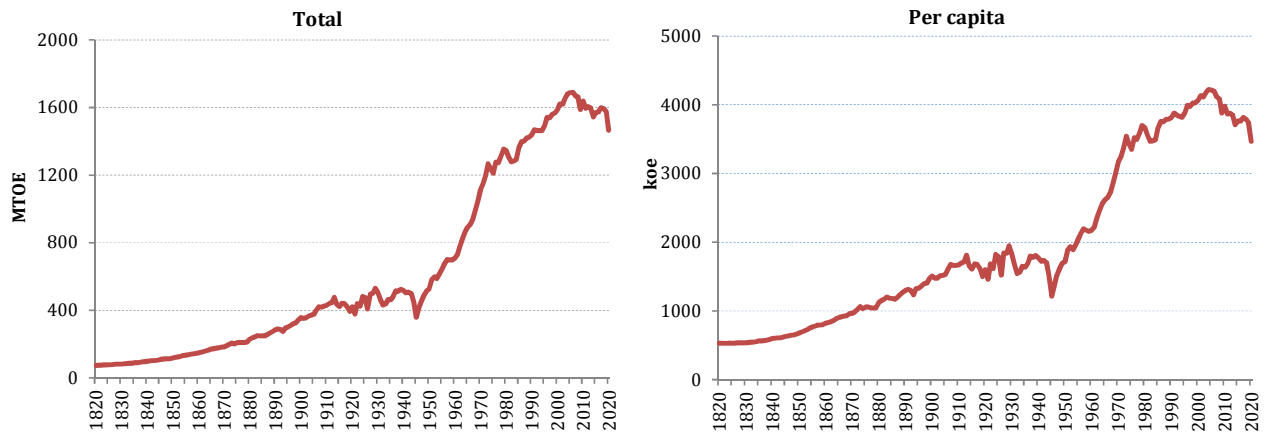


Table A.5 Total energy consumption per source in Western Europe 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	12.609	27.949	10.956	22.287						73.800
1821	12.683	27.879	11.004	22.767						74.333
1822	12.881	27.822	11.074	23.073						74.849
1823	13.022	28.079	11.179	23.682						75.961
1824	13.256	28.381	11.341	24.413						77.390
1825	13.308	27.951	11.397	24.926						77.583
1826	13.576	28.228	11.544	25.496						78.843
1827	13.595	28.294	11.644	26.407						79.940
1828	13.693	28.427	11.721	27.015						80.856
1829	13.765	28.376	11.769	27.463						81.372
1830	13.839	28.475	11.888	28.111						82.313
1831	14.079	28.739	12.052	28.645						83.515
1832	14.287	28.875	12.189	29.553						84.904
1833	14.407	28.917	12.273	30.368						85.965
1834	14.560	29.085	12.401	31.221						87.267
1835	14.873	29.793	12.563	32.349						89.578
1836	14.656	29.520	12.452	33.921						90.549
1837	14.669	29.468	12.488	35.492						92.117
1838	14.904	29.783	12.651	36.839						94.177
1839	15.016	30.077	12.818	38.104						96.015
1840	15.432	30.431	13.012	39.867						98.743
1841	15.765	30.615	13.181	41.105						100.667
1842	15.926	30.995	13.380	41.912						102.212
1843	15.838	30.745	13.362	43.189						103.133
1844	16.009	30.795	13.505	44.914						105.223
1845	16.243	30.172	13.688	48.332						108.434
1846	16.362	30.332	13.785	50.200						110.679
1847	16.382	30.271	13.830	51.854						112.337

1848	16.517	30.337	13.892	51.562				112.307
1849	16.516	30.195	13.906	53.869				114.485
1850	16.630	30.045	13.873	56.925				117.473
1851	16.729	30.083	13.881	59.691				120.385
1852	16.703	30.079	13.861	63.375				124.018
1853	16.644	30.174	13.840	66.815				127.473
1854	16.452	30.059	13.771	71.765				132.046
1855	16.382	29.749	13.871	74.605				134.607
1856	16.540	30.114	13.936	77.075				137.664
1857	16.980	30.735	14.198	79.555				141.469
1858	17.293	31.013	14.324	79.590				142.220
1859	17.189	30.934	14.336	81.090				143.550
1860	17.270	30.862	14.357	86.524				149.013
1861	17.404	30.679	14.332	89.865				152.279
1862	17.607	30.857	14.185	92.507	0.020			155.176
1863	17.870	30.916	14.135	97.298	0.031			160.249
1864	17.911	30.993	14.026	102.569	0.050			165.548
1865	18.091	30.283	14.171	107.222	0.055			169.823
1866	17.847	30.303	14.179	110.306	0.107			172.741
1867	18.145	29.554	14.222	113.217	0.146			175.284
1868	18.179	29.517	14.260	115.600	0.173			177.729
1869	18.410	29.494	14.451	119.561	0.206			182.123
1870	18.316	29.479	14.582	121.419	0.263			184.058
1871	18.224	29.362	14.634	127.008	0.327			189.555
1872	18.292	29.225	14.819	134.897	0.317			197.550
1873	18.805	29.244	14.981	142.529	0.423			205.982
1874	18.492	28.305	15.049	139.464	0.398			201.708
1875	18.762	28.395	15.173	145.300	0.488			208.118
1876	19.004	28.612	15.261	145.838	0.560			209.275
1877	19.299	28.380	15.330	145.315	0.668			208.992
1878	19.435	28.422	15.386	146.241	0.595			210.079
1879	19.167	28.039	15.392	149.338	0.690			212.626
1880	19.495	28.420	15.497	165.866	0.661			229.938
1881	19.626	28.332	15.427	173.188	0.834			237.407
1882	19.661	28.483	15.573	178.368	0.894			242.978
1883	20.045	27.689	15.782	186.607	0.967			251.090
1884	20.322	27.778	15.870	184.251	1.056			249.276
1885	20.290	28.101	16.009	183.809	1.310			249.519
1886	20.247	28.317	16.098	183.256	1.234			249.152
1887	20.616	28.667	16.114	190.212	1.291			256.901
1888	20.581	28.312	16.172	200.613	1.531			267.209
1889	20.863	27.988	16.159	208.875	1.620			275.505
1890	20.886	27.736	16.187	217.695	1.662			284.167
1891	21.078	27.749	16.575	222.293	1.830			289.526
1892	21.851	27.778	16.697	219.027	1.902			287.255
1893	20.849	27.789	16.694	207.918	2.056	0.001		275.307
1894	21.549	28.341	16.829	228.307	2.119	0.003		297.147
1895	21.476	27.852	16.908	232.631	2.280	0.004		301.152
1896	22.030	27.540	16.958	241.913	2.385	0.005		310.831
1897	21.815	27.373	17.031	252.350	2.429	0.008		321.007
1898	22.193	27.346	17.082	257.373	2.609	0.012		326.615
1899	22.403	27.186	17.172	274.624	2.675	0.016		344.076
1900	22.743	27.298	17.260	286.477	2.818	0.001	0.020	356.617
1901	22.874	27.359	17.219	281.200	2.827	0.001	0.038	351.518
1902	23.615	27.486	17.443	283.418	2.957	0.001	0.047	354.966
1903	23.784	26.879	17.567	295.509	3.047	0.002	0.058	366.845
1904	23.973	26.156	17.718	300.007	3.131	0.002	0.066	371.053
1905	24.042	25.898	17.866	306.124	3.056	0.003	0.075	377.064
1906	24.349	25.886	18.095	330.291	3.084	0.005	0.096	401.806
1907	24.936	25.728	18.398	348.412	3.175	0.005	0.128	420.782
1908	24.879	25.638	18.631	347.433	3.439	0.006	0.151	420.177
1909	25.216	25.502	18.942	350.723	3.527	0.007	0.174	424.091

1910	25.881	26.276	19.318	354.563	3.510	0.007	0.209		429.765
1911	26.196	25.981	19.561	364.461	3.600	0.008	0.240		440.046
1912	26.034	26.230	19.766	369.710	4.040	0.006	0.292		446.078
1913	25.885	26.566	19.953	398.996	4.701	0.005	0.316		476.422
1914	25.198	27.125	19.141	360.752	3.621	0.005	0.395		436.236
1915	24.763	28.346	19.405	346.818	3.379	0.005	0.454		423.170
1916	24.496	29.170	19.381	366.059	2.982	0.005	0.521		442.613
1917	24.216	30.267	19.324	360.539	4.156	0.006	0.615		439.123
1918	24.631	30.364	19.491	339.777	5.853	0.006	0.750		420.872
1919	24.924	29.920	19.240	314.554	4.065	0.007	0.726		393.437
1920	25.085	29.595	18.857	341.806	5.205	0.006	0.772		421.327
1921	25.040	28.111	17.130	301.161	6.240	0.006	0.802		378.491
1922	25.036	28.062	17.326	360.607	6.610	0.005	0.856		438.501
1923	25.624	28.295	17.428	344.109	7.844	0.006	1.335		424.641
1924	25.682	28.329	17.653	399.312	9.420	0.005	1.457		481.860
1925	25.818	29.578	17.786	389.743	11.865	0.006	1.934		476.729
1926	26.512	27.809	17.753	319.534	13.878	0.005	2.241		407.731
1927	26.658	27.147	18.260	406.769	15.405	0.005	2.357		496.600
1928	26.543	26.842	17.520	408.147	17.246	0.005	2.606		498.908
1929	26.922	27.004	17.569	438.342	18.360	0.006	3.328		531.529
1930	27.007	26.215	17.483	408.356	21.340	0.007	3.455		503.862
1931	26.856	25.822	17.626	366.852	21.172	0.010	3.405		461.744
1932	27.003	25.211	17.617	335.873	21.232	0.011	3.429		430.376
1933	27.254	25.055	17.666	340.182	23.723	0.012	3.755		437.648
1934	27.017	25.022	17.025	365.281	25.944	0.013	4.073		464.376
1935	27.103	24.996	17.423	361.234	27.988	0.011	4.871		463.626
1936	27.321	24.562	17.365	377.436	30.800	0.012	5.093		482.589
1937	27.476	25.014	17.144	411.811	28.144	0.014	6.046		515.649
1938	27.721	25.039	16.710	407.615	29.745	0.016	6.142		512.987
1939	27.359	28.347	16.529	416.188	29.433	0.018	6.892		524.765
1940	27.772	29.672	17.194	410.772	23.431	0.025	6.854		515.720
1941	27.248	32.538	17.165	399.679	18.371	0.034	7.176		502.211
1942	26.846	36.725	17.048	404.433	15.145	0.044	7.414		507.655
1943	26.179	34.339	16.538	395.042	19.996	0.087	7.793		499.973
1944	25.421	31.401	16.035	340.791	24.948	0.099	6.889		445.585
1945	24.722	35.374	15.483	253.503	22.469	0.182	6.869		358.602
1946	24.573	28.070	14.354	306.931	30.300	0.285	7.223		411.736
1947	25.948	28.921	14.366	342.262	36.487	0.365	8.506		456.856
1948	27.165	27.885	15.044	361.254	48.053	0.610	9.346		489.358
1949	27.783	27.200	15.214	385.516	49.530	0.475	9.116		514.835
1950	28.391	27.203	15.105	388.921	55.100	1.288	9.961		525.970
1951	29.513	27.126	14.675	425.348	70.561	1.587	12.577		581.388
1952	30.036	27.160	14.752	437.615	73.657	1.954	13.469		598.643
1953	29.703	27.030	14.570	421.830	79.227	2.961	13.452		588.774
1954	30.282	27.115	14.536	427.798	95.969	3.692	14.808		614.201
1955	30.678	27.309	13.937	443.404	110.378	4.513	15.656		645.875
1956	31.123	27.241	13.409	463.510	119.947	5.505	16.213	0.031	676.979
1957	31.633	27.491	13.266	472.985	130.706	6.319	17.154	0.123	699.678
1958	32.283	27.361	12.811	456.560	143.522	6.784	18.738	0.094	698.153
1959	33.164	27.091	12.528	431.740	163.995	8.764	19.945	0.383	697.608
1960	33.991	27.530	12.042	415.931	184.793	10.656	23.004	0.690	708.638
1961	35.362	28.167	11.564	412.050	206.571	12.218	23.297	0.821	730.049
1962	36.227	27.801	11.026	426.901	240.206	13.505	23.581	1.220	780.466
1963	36.659	28.135	10.620	431.803	274.815	14.195	25.936	2.050	824.211
1964	37.088	28.706	10.095	427.204	316.152	15.602	25.274	3.223	863.346
1965	37.682	28.923	9.561	408.909	355.322	17.200	27.940	5.672	891.209
1966	38.112	28.943	9.045	383.939	391.163	20.127	30.360	7.495	909.184
1967	38.650	29.316	8.372	374.351	423.105	25.510	30.374	8.903	938.581
1968	39.156	29.559	7.894	369.898	467.022	36.038	31.594	9.880	991.041
1969	39.448	29.902	7.462	362.548	515.964	49.389	30.879	12.299	1,047.891
1970	40.409	30.640	6.958	343.554	583.090	63.590	32.617	13.006	1,113.864
1971	40.713	30.078	6.126	333.408	608.583	83.592	32.913	15.006	1,150.420

1972	40.943	30.804	5.618	306.372	652.742	107.346	33.498	19.331		1,196.655
1973	41.749	30.833	5.354	310.512	698.130	124.713	34.337	21.230		1,266.859
1974	41.521	31.172	4.783	298.443	655.360	143.403	36.533	24.271		1,235.486
1975	41.223	30.625	4.374	294.361	617.474	152.762	37.253	32.347		1,210.420
1976	41.840	30.277	4.112	303.662	661.209	164.995	34.068	37.397		1,277.559
1977	41.864	30.540	3.768	297.103	645.517	168.324	41.048	44.548		1,272.711
1978	42.654	31.528	3.439	300.247	669.093	174.211	40.982	50.081		1,312.235
1979	43.337	32.641	3.167	312.743	678.812	185.264	43.028	55.460		1,354.451
1980	43.501	32.950	3.007	330.092	646.026	183.716	41.413	65.225		1,345.930
1981	43.351	33.191	2.902	321.555	596.969	179.363	42.154	87.902		1,307.385
1982	43.643	33.500	2.693	324.350	563.545	173.038	41.718	95.930		1,278.417
1983	43.734	34.745	2.643	316.224	550.104	180.580	43.645	112.376		1,284.051
1984	44.024	35.500	2.483	285.712	550.292	189.278	43.682	142.646		1,293.617
1985	44.533	35.932	2.240	325.300	540.898	197.501	43.668	171.277		1,361.348
1986	44.771	35.743	2.146	320.895	565.501	201.840	42.636	184.915		1,398.447
1987	45.218	34.866	1.963	316.907	553.980	213.396	45.990	188.972		1,401.290
1988	45.763	36.949	1.987	313.319	560.998	209.305	48.451	202.019		1,418.791
1989	45.926	37.625	1.586	306.302	559.975	215.969	43.002	213.896		1,424.280
1990	45.922	38.499	1.570	299.504	570.361	223.740	46.022	213.080	0.006	1,438.705
1991	46.671	39.654	1.530	287.759	584.017	242.124	46.248	220.779	0.007	1,468.790
1992	47.119	41.199	1.513	265.921	594.221	240.226	49.365	224.524	0.018	1,464.108
1993	46.399	41.543	1.495	245.889	587.992	254.300	51.274	234.359	0.045	1,463.296
1994	46.488	41.750	1.486	242.600	590.832	255.061	52.177	233.976	0.125	1,464.495
1995	46.744	42.352	1.227	237.815	596.271	275.543	53.181	239.380	0.192	1,492.706
1996	47.490	43.270	1.227	233.050	608.228	305.867	50.971	251.275	0.284	1,541.661
1997	47.366	42.208	1.215	223.965	609.749	304.641	55.487	253.854	0.386	1,538.870
1998	48.369	42.305	1.199	219.868	620.003	317.326	59.619	252.022	0.353	1,561.065
1999	48.701	42.653	1.184	208.918	615.922	331.514	62.362	255.844	0.393	1,567.492
2000	48.809	42.980	1.065	219.003	608.167	341.143	69.943	255.277	0.594	1,586.980
2001	49.307	40.163	1.074	220.685	623.558	353.062	72.385	259.574	0.689	1,620.496
2002	49.776	41.384	0.864	218.881	616.365	355.215	72.364	264.144	0.923	1,619.916
2003	49.403	42.830	0.862	225.694	622.021	372.380	75.120	265.391	1.155	1,654.857
2004	49.731	45.020	0.862	224.888	624.743	382.901	85.133	266.731	1.646	1,681.655
2005	49.891	46.692	0.856	216.590	621.473	391.766	92.351	265.082	2.840	1,687.539
2006	50.138	46.326	0.624	219.845	622.006	384.099	98.893	264.023	4.455	1,690.410
2007	50.323	47.399	0.597	220.869	600.198	381.408	111.751	249.181	6.181	1,667.907
2008	50.791	47.975	0.598	201.422	595.469	388.907	122.772	247.683	7.922	1,663.539
2009	51.328	52.766	0.592	175.756	561.292	371.241	130.018	235.480	9.226	1,587.699
2010	51.440	48.716	0.589	180.557	559.322	395.906	145.294	244.357	10.646	1,636.826
2011	51.318	53.456	0.588	186.387	537.659	353.770	160.212	240.872	11.089	1,595.350
2012	51.607	53.435	0.582	199.734	523.784	344.492	185.339	233.297	11.802	1,604.071
2013	51.879	50.464	0.565	194.133	516.447	339.513	204.053	229.724	10.703	1,597.481
2014	51.698	50.417	0.554	179.606	503.570	300.614	215.567	229.855	11.589	1,543.472
2015	52.321	49.857	0.558	173.595	505.008	315.695	241.912	218.996	11.685	1,569.626
2016	52.583	49.839	0.555	152.589	509.486	339.344	243.990	212.663	12.022	1,573.072
2017	52.854	50.292	0.546	146.915	515.062	349.256	264.868	206.308	12.698	1,598.798
2018	53.110	50.399	0.000	136.685	511.718	343.662	278.953	205.153	13.376	1,593.056
2019	53.042	50.563	0.000	102.761	505.227	352.776	296.302	202.677	13.564	1,576.912
2020	53.172	50.711	0.000	79.724	431.869	336.944	320.430	178.818	14.056	1,465.724

Eastern Europe Consumption

Figure A.7 Total and per capita energy consumption per source in Eastern Europe 1820-2020 (Mtoe and koe)

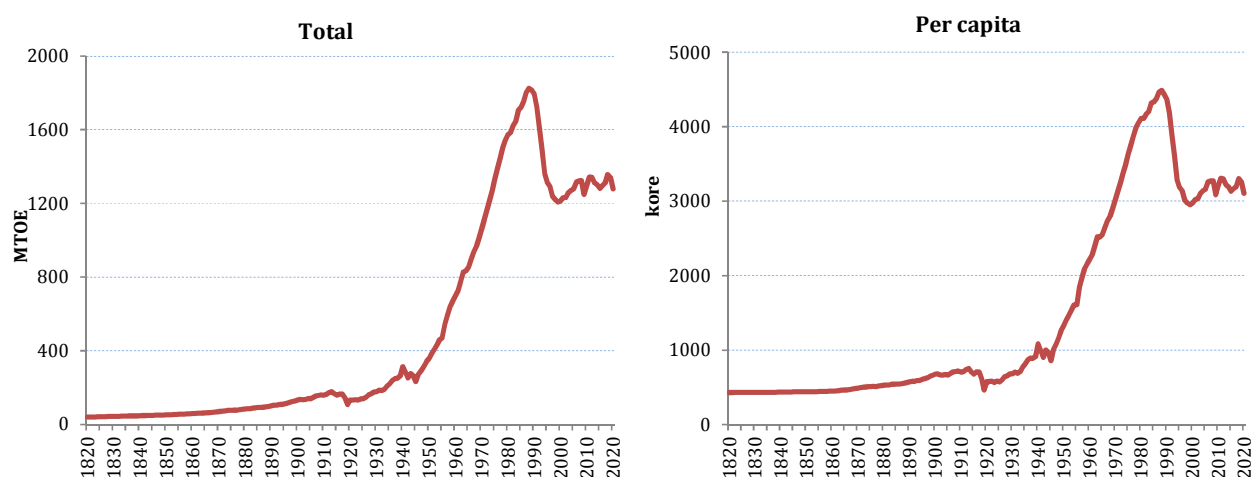


Table A.6 Total energy consumption per source in Eastern Europe 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	7.514	22.581	9.088	0.245						39.429
1821	7.585	22.776	9.162	0.271						39.794
1822	7.657	22.972	9.236	0.297						40.163
1823	7.730	23.170	9.311	0.399						40.610
1824	7.804	23.370	9.385	0.417						40.976
1825	7.878	23.572	9.460	0.434						41.343
1826	7.952	23.775	9.534	0.399						41.661
1827	8.028	23.981	9.609	0.428						42.046
1828	8.104	24.188	9.685	0.396						42.373
1829	8.181	24.397	9.760	0.349						42.687
1830	8.259	24.608	9.836	0.428						43.131
1831	8.338	24.820	9.913	0.368						43.439
1832	8.417	25.035	9.989	0.447						43.888
1833	8.497	25.252	10.066	0.458						44.274
1834	8.578	25.470	10.144	0.499						44.691
1835	8.660	25.691	10.222	0.529						45.102
1836	8.742	25.914	10.301	0.593						45.549
1837	8.826	26.138	10.380	0.630						45.974
1838	8.910	26.365	10.460	0.699						46.433
1839	8.995	26.594	10.540	0.776						46.905
1840	9.080	26.824	10.622	0.889						47.416
1841	9.167	27.057	10.704	0.971						47.899
1842	9.254	27.292	10.787	1.020						48.353
1843	9.343	27.529	10.870	0.996						48.738
1844	9.432	27.768	10.955	1.115						49.269
1845	9.522	28.010	11.040	1.291						49.862

1846	9.613	28.253	11.126	1.393		50.386
1847	9.705	28.499	11.214	1.429		50.846
1848	9.797	28.747	11.302	1.468		51.314
1849	9.891	28.997	11.391	1.377		51.657
1850	9.986	29.250	11.482	1.452		52.169
1851	10.085	29.409	11.582	1.593		52.669
1852	10.183	29.562	11.680	1.842		53.268
1853	10.283	29.716	11.780	2.042		53.821
1854	10.383	29.871	11.881	2.198		54.333
1855	10.484	30.027	11.983	2.580		55.074
1856	10.587	30.184	12.085	2.909		55.765
1857	10.690	30.342	12.189	3.162		56.384
1858	10.795	30.501	12.293	2.940		56.530
1859	10.900	30.662	12.398	3.581		57.542
1860	11.007	30.823	12.504	3.795	0.004	58.133
1861	11.115	31.152	12.610	4.192	0.003	59.072
1862	11.224	31.485	12.716	4.658	0.004	60.086
1863	11.334	31.821	12.822	5.121	0.006	61.105
1864	11.446	32.162	12.929	5.503	0.008	62.047
1865	11.558	32.506	13.035	6.163	0.009	63.271
1866	11.672	32.854	13.140	6.550	0.011	64.228
1867	11.787	33.206	13.245	7.392	0.016	65.647
1868	11.903	33.563	13.349	8.127	0.029	66.971
1869	12.020	33.923	13.453	8.712	0.028	68.135
1870	12.136	34.279	13.551	9.354	0.028	69.348
1871	12.288	34.579	13.667	11.009	0.023	71.567
1872	12.442	34.883	13.783	11.606	0.025	72.739
1873	12.599	35.189	13.897	12.414	0.056	74.155
1874	12.757	35.499	14.009	13.363	0.109	75.737
1875	12.917	35.811	14.121	13.578	0.164	76.591
1876	13.080	36.127	14.231	14.455	0.255	78.148
1877	13.244	36.445	14.340	13.923	0.354	78.308
1878	13.411	36.767	14.448	15.162	0.421	80.209
1879	13.580	37.092	14.555	16.172	0.525	81.924
1880	13.751	37.420	14.661	17.109	0.593	83.534
1881	13.924	37.671	14.765	17.441	0.814	84.615
1882	14.099	37.923	14.868	18.055	0.887	85.833
1883	14.277	38.178	14.971	20.012	0.961	88.399
1884	14.457	38.435	15.072	20.170	1.386	89.519
1885	14.639	38.693	15.172	20.914	1.758	91.177
1886	14.736	38.954	15.271	21.283	1.809	92.053
1887	15.129	39.217	15.369	21.568	2.294	93.577
1888	15.231	39.482	15.466	23.421	2.494	96.095
1889	15.282	39.749	15.563	25.144	2.500	98.238
1890	15.439	40.018	15.658	26.608	3.068	100.791
1891	15.466	40.271	15.754	28.222	3.728	103.441
1892	15.777	40.525	15.849	28.059	3.871	104.080
1893	16.148	40.781	15.945	30.267	4.575	107.715
1894	16.531	41.039	16.042	31.161	4.226	108.998
1895	16.581	41.298	16.141	32.876	5.808	112.704
1896	16.920	41.560	16.245	34.451	6.006	115.182
1897	17.074	41.824	16.354	37.122	6.748	119.121
1898	17.303	42.089	16.469	40.304	8.585	124.750
1899	17.592	42.356	16.591	43.282	8.142	127.963
1900	17.628	42.625	16.722	45.205	10.507	132.687
1901	18.044	42.857	16.923	46.538	10.713	135.075
1902	18.453	43.091	17.136	45.239	10.277	134.195
1903	18.590	43.328	17.362	46.807	9.543	135.630
1904	19.045	43.566	17.601	49.291	10.142	139.645
1905	19.093	43.807	17.855	51.149	7.819	139.724
1906	19.285	44.050	18.123	55.682	8.844	145.984
1907	19.489	44.295	18.405	61.607	9.721	153.518

1908	19.945	44.542	18.701	63.198	10.284			156.671
1909	20.310	44.792	19.011	64.445	11.467			160.025
1910	20.610	45.044	19.334	62.928	11.262			159.177
1911	20.874	45.146	19.665	66.780	10.672			163.138
1912	21.335	45.250	20.009	75.044	10.580			172.218
1913	21.605	45.356	20.363	80.261	10.036			177.621
1914	21.576	44.660	20.360	69.236	10.518			166.350
1915	21.563	43.977	20.356	61.415	11.605			158.915
1916	21.246	43.305	20.347	68.838	11.684			165.421
1917	20.907	42.645	20.329	70.821	10.306			165.008
1918	19.828	41.996	20.296	55.015	5.458			142.593
1919	19.458	41.358	20.244	20.401	6.175			107.637
1920	19.403	40.731	20.169	46.710	5.819			132.832
1921	19.148	40.153	20.054	47.558	5.750		0.001	132.665
1922	19.526	39.892	20.067	47.561	6.913	0.548	0.001	134.508
1923	19.985	39.818	20.146	43.312	7.770	0.661	0.002	131.694
1924	20.792	40.020	20.339	47.695	8.382	0.773	0.003	138.003
1925	21.667	40.367	20.582	45.771	8.829	0.885	0.007	138.107
1926	22.345	40.736	20.815	52.290	10.353	0.998	0.009	147.546
1927	22.842	41.048	21.000	62.618	11.561	1.110	0.031	160.211
1928	23.334	41.296	21.137	66.591	12.468	1.222	0.073	166.121
1929	23.677	41.469	21.221	74.376	13.600	1.558	0.078	175.979
1930	24.096	41.546	21.246	71.475	17.621	1.894	0.089	177.966
1931	24.382	41.729	21.233	75.030	21.035	2.230	0.105	185.744
1932	24.517	41.750	21.133	73.770	19.259	2.566	0.123	183.118
1933	24.752	41.729	21.007	80.180	19.926	2.902	0.162	190.658
1934	25.150	41.772	20.914	92.751	23.751	3.238	0.272	207.848
1935	25.668	41.824	20.826	103.245	25.536	3.574	0.401	221.074
1936	26.091	41.978	20.792	116.466	28.905	3.910	0.454	238.595
1937	26.668	42.313	20.853	123.508	30.301	4.246	0.485	248.375
1938	27.125	42.769	20.978	122.764	32.733	4.301	0.567	251.237
1939	27.684	43.209	21.100	128.876	37.281	4.357	0.535	263.042
1940	27.417	43.311	21.060	179.621	37.416	4.412	0.582	313.819
1941	22.871	41.854	20.467	155.079	38.900	4.468	0.105	283.744
1942	21.970	40.472	19.903	127.865	37.999	4.524	0.084	252.817
1943	21.093	39.136	19.351	157.242	34.443	4.580	0.068	275.914
1944	20.752	37.878	18.826	138.791	42.561	4.636	0.100	263.542
1945	21.712	37.215	18.584	123.435	25.773	4.783	0.568	232.070
1946	25.638	36.564	18.335	156.613	29.933	5.038	0.790	272.910
1947	25.898	35.924	18.080	171.974	33.280	5.691	0.901	291.748
1948	26.162	35.296	17.817	190.190	35.513	7.481	1.208	313.667
1949	26.427	34.678	17.547	210.965	39.867	9.904	1.385	340.774
1950	26.696	34.071	17.268	227.536	41.698	8.939	1.524	357.733
1951	27.367	33.673	17.257	247.143	46.008	10.304	1.655	383.408
1952	28.100	33.309	17.247	264.038	51.390	11.507	1.797	407.388
1953	28.867	32.965	17.228	281.351	56.721	12.647	2.218	431.996
1954	29.718	32.629	17.196	301.448	63.106	13.514	2.189	459.800
1955	30.532	32.295	17.145	296.131	74.305	15.173	2.843	468.424
1956	31.287	31.956	17.072	357.395	86.176	18.571	3.420	545.878
1957	32.197	31.611	16.978	383.601	99.013	25.325	4.516	593.241
1958	33.027	31.257	16.860	406.221	110.426	35.175	5.299	638.264
1959	33.866	30.895	16.721	418.446	120.292	42.874	5.430	668.523
1960	34.761	30.526	16.561	424.250	132.232	52.624	6.000	696.954
1961	35.645	29.996	16.381	429.390	144.563	64.058	6.784	726.817
1962	36.900	29.461	16.182	441.786	164.295	78.230	8.240	775.094
1963	37.832	28.918	15.963	457.876	181.200	94.509	8.712	825.010
1964	38.578	28.364	15.724	432.296	196.593	112.955	8.847	833.740
1965	39.474	27.796	15.466	438.882	200.424	123.101	9.522	855.112
1966	40.447	27.214	15.193	449.183	215.942	137.166	10.601	896.244
1967	40.666	26.624	14.910	454.488	236.653	151.555	10.770	936.209
1968	41.250	26.030	14.624	453.693	253.781	164.317	12.322	966.773
1969	41.793	25.443	14.344	463.221	273.199	178.504	13.584	1,010.961

1970	41.891	24.866	14.075	465.535	300.725	196.828	14.827	1.057	1,059.804	
1971	42.755	24.406	13.822	476.066	321.098	214.651	15.150	1.297	1,109.245	
1972	42.983	23.953	13.589	489.937	346.810	225.037	15.379	2.366	1,160.055	
1973	43.737	23.508	13.378	494.447	378.295	244.167	15.211	3.511	1,216.255	
1974	44.754	23.070	13.193	496.377	408.907	258.758	16.832	5.570	1,267.461	
1975	45.053	22.638	13.037	513.100	430.571	282.211	16.125	7.667	1,330.403	
1976	46.160	22.214	12.912	517.949	446.015	312.117	17.113	10.729	1,385.208	
1977	46.182	21.796	12.821	529.198	466.240	334.650	18.905	13.980	1,443.773	
1978	46.905	21.386	12.766	534.664	495.083	356.214	20.240	14.305	1,501.562	
1979	47.009	20.981	12.747	540.587	504.520	374.944	21.959	16.696	1,539.444	
1980	47.577	20.583	12.766	537.449	521.030	389.120	22.786	20.823	1,572.133	
1981	47.503	20.352	12.821	527.300	518.720	411.044	22.731	25.096	1,585.566	
1982	47.325	20.120	12.912	537.310	512.038	439.806	21.181	29.496	1,620.188	
1983	47.966	19.888	13.039	541.402	502.445	466.637	21.457	33.767	1,646.601	
1984	48.402	19.657	13.201	544.842	506.451	505.803	24.116	42.483	1,704.954	
1985	48.742	19.428	13.398	547.004	499.900	521.535	22.261	50.315	1,722.584	
1986	49.391	19.202	13.627	558.222	502.458	538.507	22.651	50.406	1,754.464	
1987	50.061	18.975	13.882	566.264	508.359	562.907	22.701	59.610	1,802.759	
1988	50.311	18.742	14.155	557.045	501.368	589.982	23.085	70.245	1,824.933	
1989	50.393	18.491	14.429	534.350	500.511	604.006	22.248	69.740	1,814.169	
1990	49.718	18.254	14.720	495.611	501.986	624.087	22.481	67.549	1,794.407	
1991	47.424	17.701	14.971	460.683	473.789	620.264	23.020	67.036	1,724.888	
1992	44.481	17.136	15.183	436.237	419.386	584.398	23.219	65.646	1,605.687	
1993	45.232	16.557	15.339	403.493	350.719	569.070	24.053	66.167	1,490.630	
1994	44.554	15.980	15.440	356.403	311.388	531.418	24.698	59.424	1,359.305	
1995	44.334	15.418	15.488	343.781	289.118	518.916	25.125	61.324	1,313.504	
1996	43.332	14.872	15.476	332.936	258.616	537.393	23.181	67.539	1,293.344	
1997	44.103	14.342	15.400	316.853	259.151	497.831	23.273	67.793	1,238.746	
1998	44.111	13.831	15.260	297.912	253.496	505.374	24.312	65.965	1,220.261	
1999	44.163	13.333	15.052	284.852	245.317	511.145	24.618	68.937	1,207.417	
2000	43.835	12.851	14.779	288.198	240.024	515.787	24.200	73.830	0.069	1,213.573
2001	44.727	12.536	14.448	287.841	244.365	524.598	25.433	76.450	0.083	1,230.482
2002	45.474	12.579	14.067	288.476	240.855	525.764	24.460	80.033	0.075	1,231.784
2003	45.756	13.140	13.646	293.455	246.781	537.837	23.131	83.608	0.100	1,257.453
2004	46.349	12.235	13.191	286.761	249.805	550.910	26.579	83.440	0.050	1,269.320
2005	47.301	12.526	12.709	279.995	253.520	560.518	27.692	83.732	0.068	1,278.061
2006	47.660	12.514	12.204	292.211	263.034	575.003	27.903	85.484	0.178	1,316.192
2007	48.257	12.934	11.683	293.991	264.091	578.544	27.560	85.587	0.347	1,322.994
2008	48.369	13.318	11.150	299.815	266.928	567.230	28.040	87.340	1.066	1,323.256
2009	48.295	14.310	10.588	272.615	255.693	530.376	30.374	85.113	1.445	1,248.808
2010	48.900	15.566	10.051	280.570	258.180	566.420	32.850	85.611	1.502	1,299.650
2011	49.428	15.670	9.507	294.130	271.131	581.924	32.167	86.851	1.733	1,342.539
2012	48.843	16.097	8.959	294.114	275.568	572.987	34.673	87.572	1.827	1,340.639
2013	48.972	16.181	8.408	283.867	268.068	560.106	40.409	84.083	1.836	1,311.929
2014	49.693	15.467	7.856	270.574	276.467	551.908	41.477	86.986	1.932	1,302.359
2015	49.686	15.429	7.309	263.348	272.909	536.407	45.905	88.223	1.893	1,281.109
2016	49.870	16.214	6.762	264.816	278.999	545.646	47.692	85.586	1.797	1,297.382
2017	50.337	16.189	6.208	254.370	285.901	556.789	49.685	89.036	1.945	1,310.462
2018	50.283	16.210	6.216	264.967	293.818	584.621	50.016	88.934	2.367	1,357.431
2019	49.738	15.410	6.167	250.713	296.719	577.281	53.406	88.686	2.488	1,340.608
2020	49.779	15.420	6.172	229.125	279.788	548.936	58.871	88.381	2.442	1,278.916

North America Consumption

Figure A.8 Total and per capita energy consumption per source in North America 1820-2020 (Mtoe and koe)

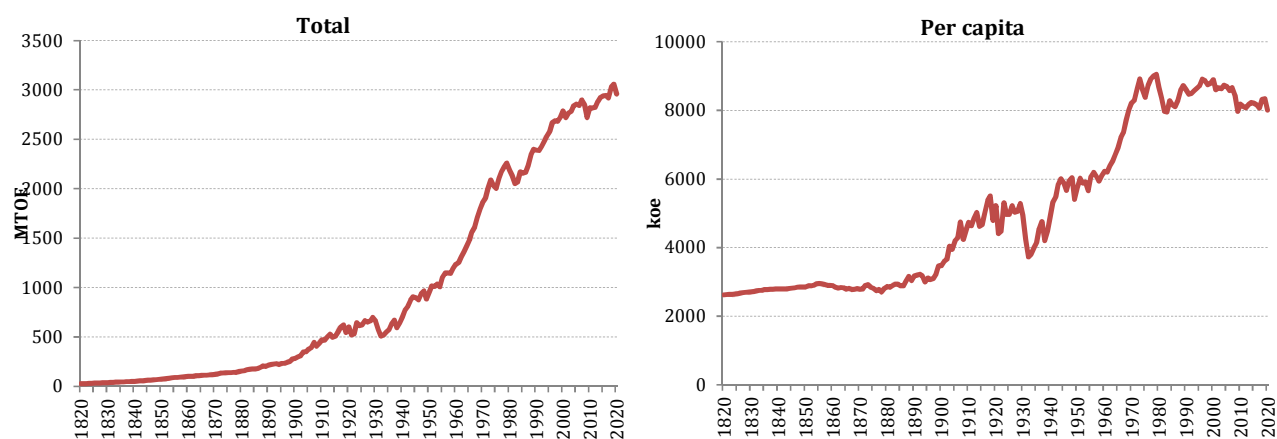


Table A.7 Total energy consumption per source in North America 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	1.106	23.524	2.456	0.268						27.354
1821	1.139	24.300	2.537	0.281						28.257
1822	1.174	25.101	2.624	0.289						29.188
1823	1.209	26.046	2.735	0.299						30.289
1824	1.261	27.041	2.830	0.331						31.462
1825	1.296	28.060	2.933	0.364						32.653
1826	1.330	28.997	3.068	0.413						33.808
1827	1.388	29.937	3.251	0.450						35.026
1828	1.423	30.785	3.251	0.513						35.971
1829	1.457	31.636	3.330	0.568						36.990
1830	1.491	32.490	3.417	0.648						38.046
1831	1.536	33.550	3.493	0.696						39.275
1832	1.582	34.663	3.674	0.902						40.821
1833	1.627	35.779	3.789	1.040						42.234
1834	1.672	36.900	3.937	1.025						43.534
1835	1.718	38.049	4.061	1.288						45.115
1836	1.763	39.111	4.220	1.392						46.485
1837	1.843	40.197	4.333	1.547						47.919
1838	1.894	41.260	4.481	1.499						49.133
1839	1.963	42.347	4.605	1.632						50.546
1840	2.038	43.434	4.741	1.730						51.943
1841	2.031	44.997	4.843	1.846						53.716
1842	2.051	46.536	4.932	2.038						55.558
1843	2.043	48.100	5.046	2.270						57.459
1844	2.031	49.641	5.173	2.713						59.558
1845	2.089	51.206	5.250	3.232						61.777
1846	2.171	52.607	5.363	3.645						63.786
1847	2.229	53.999	5.453	4.313						65.994
1848	2.287	55.405	5.581	4.786						68.058

1849	2.369	57.208	5.728	5.208				70.513
1850	2.464	59.098	5.890	5.644				73.096
1851	2.579	61.562	6.229	6.990				77.359
1852	2.671	63.392	6.373	7.608				80.043
1853	2.798	65.234	6.605	8.548				83.184
1854	2.882	67.063	6.828	10.053				86.826
1855	2.977	68.881	7.052	10.799				89.708
1856	3.097	70.330	7.294	11.345				92.065
1857	3.193	71.770	7.499	11.644				94.105
1858	3.291	73.152	7.723	11.836				96.002
1859	3.413	74.526	7.946	12.867				98.752
1860	3.619	75.866	8.085	13.416	0.073			101.059
1861	3.700	76.930	8.400	12.768	0.108			101.906
1862	3.816	77.869	8.424	13.169	0.143			103.422
1863	3.934	78.780	8.448	15.272	0.178			106.613
1864	4.053	79.663	8.494	16.425	0.213			108.847
1865	4.174	80.540	8.497	16.432	0.248			109.891
1866	4.319	80.765	8.521	19.292	0.258			113.155
1867	4.443	80.938	8.546	20.040	0.267			114.233
1868	4.568	81.082	8.694	22.727	0.276			117.347
1869	4.695	81.150	8.815	25.571	0.285			120.516
1870	4.855	81.093	9.053	27.029	0.294			122.324
1871	4.986	82.003	9.395	28.336	0.294			125.013
1872	5.141	82.755	9.758	34.697	0.293			132.644
1873	5.322	83.493	10.033	38.148	0.293			137.289
1874	5.480	83.883	10.312	36.753	0.293			136.721
1875	5.641	84.354	10.581	37.361	0.293			138.230
1876	5.804	84.131	10.872	36.648	0.737			138.191
1877	5.993	84.014	11.158	40.247	1.181			142.592
1878	6.159	83.502	11.462	39.119	1.626			141.868
1879	6.282	83.074	11.782	47.288	2.070			150.495
1880	6.439	82.680	12.147	53.184	2.562			157.012
1881	6.521	82.253	12.404	56.157	2.269			159.604
1882	6.671	81.730	12.660	63.095	1.999	0.092		166.247
1883	6.821	81.016	13.025	69.369	1.706	0.210		172.147
1884	6.995	80.111	13.466	73.387	1.437	0.650		176.046
1885	7.145	79.111	13.873	74.070	1.144	2.059		177.402
1886	7.189	78.247	14.379	76.533	1.742	2.942		181.033
1887	7.337	77.306	14.882	88.081	2.341	3.825		193.771
1888	7.484	76.263	15.482	99.999	2.940	4.708		206.875
1889	7.656	75.094	15.955	95.212	3.538	5.591		203.047
1890	7.767	73.800	16.483	106.423	4.137	6.474	0.555	215.638
1891	7.954	72.502	16.971	113.872	4.197	5.921	0.735	222.154
1892	8.105	71.052	17.467	120.917	4.258	5.369	0.975	228.143
1893	8.305	69.498	17.831	123.122	4.319	4.816	1.292	229.183
1894	8.477	67.841	18.216	115.330	4.379	4.264	1.712	220.219
1895	8.648	66.081	18.381	129.813	4.440	3.711	2.270	233.343
1896	8.821	65.212	18.536	129.426	4.728	4.242	2.784	233.749
1897	8.995	64.278	18.516	135.083	5.039	4.773	3.415	240.099
1898	9.193	63.302	18.539	148.212	5.327	5.304	4.190	254.065
1899	9.368	62.259	18.664	171.268	5.614	5.835	5.140	278.148
1900	9.529	59.104	18.868	177.723	5.878	6.366	6.329	283.796
1901	9.694	56.295	18.997	194.322	6.403	7.070	6.901	299.682
1902	9.879	55.451	19.083	202.326	9.251	7.530	7.525	311.046
1903	10.075	54.532	19.276	238.083	11.390	7.991	8.206	349.553
1904	10.279	53.538	19.572	234.210	13.562	8.316	8.972	348.450
1905	10.497	52.469	19.743	261.186	15.530	9.372	9.782	378.581
1906	10.374	52.541	20.051	275.391	14.130	10.348	10.455	393.288
1907	10.575	52.776	20.461	319.074	19.852	10.889	11.197	444.824
1908	10.696	52.866	20.995	277.321	20.828	10.754	11.965	405.425
1909	10.920	52.905	21.309	306.025	21.448	12.867	12.787	438.260
1910	11.153	52.893	21.706	333.793	25.628	13.598	13.689	472.459

1911	11.451	52.771	22.147	328.978	26.545	14.017	14.246	470.155
1912	11.637	52.554	22.477	355.792	27.192	15.386	14.851	499.888
1913	11.908	52.386	22.710	378.936	31.243	16.179	15.479	528.840
1914	12.179	52.147	23.072	342.183	34.113	16.474	16.132	496.300
1915	12.399	51.790	23.292	350.207	36.513	17.483	16.810	508.492
1916	12.594	50.750	23.306	390.348	38.753	20.985	17.215	553.951
1917	12.794	49.793	23.589	429.614	45.386	22.116	17.628	600.920
1918	12.958	48.800	23.314	449.809	49.722	19.948	18.050	622.600
1919	13.075	47.841	23.108	366.257	56.441	20.516	18.505	545.746
1920	13.645	46.870	22.477	411.768	68.640	20.930	18.970	603.299
1921	14.071	46.365	21.944	331.067	69.942	17.250	18.650	519.289
1922	14.214	45.600	21.407	334.943	80.351	19.821	18.386	534.722
1923	14.541	44.789	20.832	421.313	98.616	25.968	18.105	644.164
1924	14.928	43.933	19.758	389.972	98.774	29.325	17.878	614.568
1925	15.263	43.009	18.878	388.789	109.525	30.453	17.611	623.528
1926	15.560	43.085	18.469	421.357	114.513	33.537	18.158	664.677
1927	15.857	43.137	17.867	399.971	117.049	36.815	18.834	649.530
1928	16.040	43.213	17.339	397.982	127.618	39.886	19.449	661.526
1929	16.222	43.265	16.807	410.859	142.524	48.767	20.049	698.494
1930	16.374	43.580	16.325	364.637	152.111	49.467	20.493	662.987
1931	16.542	43.358	15.799	298.772	134.103	42.994	20.639	572.207
1932	16.689	41.847	15.355	249.803	122.852	39.806	20.931	507.283
1933	16.734	41.649	14.872	255.977	129.227	39.875	21.299	519.633
1934	16.833	41.403	14.588	279.297	129.672	45.291	21.886	548.969
1935	16.523	41.157	14.369	284.168	147.377	49.032	22.357	574.984
1936	16.598	41.010	14.060	321.349	163.126	55.495	22.884	634.521
1937	16.693	40.886	13.686	335.786	177.193	61.753	23.251	669.247
1938	16.934	40.738	13.252	268.042	173.739	58.802	23.719	595.226
1939	17.014	40.590	12.914	299.358	184.162	63.264	24.314	641.616
1940	17.242	39.009	12.747	337.748	201.649	68.259	24.844	701.498
1941	17.445	39.619	12.455	382.792	223.128	71.295	27.434	774.168
1942	17.669	39.153	12.115	419.976	209.428	77.499	30.360	806.199
1943	17.920	38.999	11.744	457.038	224.327	86.757	33.406	870.190
1944	18.120	38.319	11.240	455.667	252.087	93.873	36.481	905.786
1945	18.091	37.963	10.571	428.720	264.371	98.943	39.845	898.504
1946	18.217	39.536	9.696	392.566	273.110	101.715	39.927	874.767
1947	18.520	40.903	8.846	419.632	296.210	112.044	40.081	936.235
1948	18.818	41.796	8.151	405.632	327.882	125.184	39.996	967.458
1949	18.945	44.686	7.444	327.830	312.977	131.404	40.198	883.483
1950	19.261	45.125	6.822	340.079	350.843	152.408	40.321	954.860
1951	19.614	44.520	6.134	344.794	382.037	179.987	41.059	1,018.145
1952	19.951	43.259	5.409	311.535	396.791	192.699	42.502	1,012.146
1953	20.330	42.038	4.779	311.293	414.237	202.015	41.524	1,036.215
1954	20.734	41.659	4.231	266.374	423.398	213.272	40.519	1,010.187
1955	21.098	39.185	3.798	303.003	463.059	230.928	41.023	1,102.092
1956	21.232	37.165	3.534	309.494	484.975	247.112	43.415	1,146.927
1957	21.611	35.079	3.224	293.304	485.163	263.238	45.744	1,147.366
1958	21.968	34.608	3.022	256.840	500.166	276.589	48.245	1,141.487
1959	22.355	35.241	2.814	255.507	524.174	304.639	47.745	1,192.529
1960	22.400	34.361	2.699	263.062	540.095	323.949	49.997	1,236.715
1961	22.766	33.723	2.558	256.529	549.486	336.544	51.381	1,253.483
1962	23.112	34.168	2.429	263.813	571.293	358.532	55.868	1,309.881
1963	23.836	34.183	2.305	277.105	590.545	376.833	55.209	1,360.978
1964	24.165	34.369	2.191	292.387	606.181	400.077	59.196	1,419.571
1965	24.538	34.224	2.072	309.173	631.576	414.643	63.231	1,480.547
1966	24.941	35.061	1.962	323.050	663.909	447.784	64.411	1,562.738
1967	25.262	34.262	1.881	316.979	687.542	472.808	72.054	1,613.022
1968	25.589	36.178	1.784	327.925	733.961	507.605	72.441	1,709.320
1969	25.989	36.668	1.706	329.232	769.652	547.295	81.184	1,795.759
1970	26.413	35.733	1.622	329.102	803.086	578.643	81.534	1,862.471
1971	26.766	35.700	1.553	310.866	834.639	596.871	86.509	1,904.474
1972	27.099	37.384	1.487	324.585	900.070	607.026	89.114	2,003.424

1973	27.334	38.021	1.415	344.352	955.043	605.520	89.905	27.080		2,088.669
1974	27.585	38.307	1.367	335.444	910.308	586.924	99.814	36.102		2,035.852
1975	27.857	37.356	1.298	339.602	903.431	542.938	99.186	51.344		2,003.012
1976	28.218	42.631	1.256	362.457	965.954	553.133	95.769	57.856		2,107.273
1977	28.499	45.644	1.184	371.270	1,026.489	543.289	79.248	75.882		2,171.505
1978	28.773	50.626	1.184	366.892	1,046.924	545.673	96.100	85.790		2,221.962
1979	29.201	53.456	1.139	402.852	1,033.427	563.103	95.848	79.583		2,258.610
1980	29.239	61.411	1.165	412.686	957.595	551.530	96.311	79.399		2,189.336
1981	29.835	62.109	1.094	426.083	892.270	539.289	95.842	86.264	0.178	2,132.966
1982	29.955	62.512	1.025	413.336	837.449	504.919	112.988	90.044	0.483	2,052.710
1983	30.607	66.872	1.025	427.953	828.458	493.757	122.377	94.794	0.889	2,066.733
1984	31.341	66.981	0.957	462.737	854.852	526.232	122.897	104.663	1.092	2,171.752
1985	32.581	67.028	0.932	471.923	848.715	499.715	115.390	120.250	1.321	2,157.855
1986	32.691	64.002	0.863	463.770	879.812	470.946	119.953	131.023	1.524	2,164.584
1987	33.785	61.531	0.887	485.197	900.796	497.583	110.788	142.179	1.752	2,234.498
1988	34.152	64.238	0.888	511.064	936.993	523.621	102.980	164.817	1.778	2,340.530
1989	34.204	66.734	0.842	514.118	939.091	558.042	118.742	164.178	1.803	2,397.754
1990	35.126	55.414	0.866	516.522	924.186	556.143	126.197	174.888	1.600	2,390.942
1991	35.871	55.626	0.866	510.977	901.329	566.912	128.071	186.319	1.670	2,387.641
1992	36.704	57.844	0.798	515.256	916.675	589.748	120.264	186.521	1.899	2,425.708
1993	37.722	56.553	0.820	531.583	926.426	608.291	129.006	188.591	2.219	2,481.212
1994	38.838	58.001	0.820	534.222	949.320	623.344	125.862	199.704	2.484	2,532.598
1995	38.476	59.009	0.751	538.935	944.276	650.790	140.103	206.490	2.665	2,581.496
1996	39.095	60.485	0.752	563.810	979.662	666.026	151.941	205.328	1.912	2,669.012
1997	40.296	58.726	0.751	577.029	996.340	668.719	153.300	190.049	2.420	2,687.630
1998	40.920	54.033	0.751	576.317	1,011.563	654.659	143.388	198.789	2.781	2,683.202
1999	41.545	54.672	0.682	574.325	1,038.577	655.719	144.577	213.053	2.905	2,726.056
2000	42.871	55.764	0.683	600.152	1,053.323	677.721	134.197	219.220	3.320	2,787.252
2001	42.737	49.501	0.682	584.581	1,052.799	646.738	114.688	224.533	3.519	2,719.778
2002	43.874	49.243	0.682	584.518	1,054.492	669.507	131.104	227.143	4.178	2,764.741
2003	44.187	49.408	0.682	594.968	1,075.803	653.146	135.988	222.272	5.632	2,782.087
2004	44.911	52.326	0.614	596.702	1,116.265	653.434	135.906	233.329	7.072	2,840.560
2005	45.480	52.696	0.613	605.088	1,124.087	645.146	141.794	232.236	8.265	2,855.406
2006	45.358	52.024	0.613	595.388	1,113.971	635.947	152.390	235.283	11.516	2,842.490
2007	45.677	51.768	0.613	604.137	1,112.321	678.202	151.534	240.167	14.992	2,899.412
2008	45.348	50.440	0.614	594.060	1,045.350	681.390	169.932	240.077	20.369	2,847.580
2009	45.148	46.434	0.613	520.214	995.460	666.729	184.594	236.589	23.002	2,718.781
2010	45.657	49.014	0.544	549.778	1,015.030	699.569	194.072	238.750	26.456	2,818.871
2011	45.824	51.106	0.544	517.733	996.803	716.996	223.672	235.401	28.939	2,817.017
2012	49.300	49.289	0.544	459.477	1,038.743	744.489	223.009	230.541	29.396	2,824.790
2013	49.685	50.078	0.544	452.868	1,063.753	767.862	227.756	237.595	31.582	2,881.724
2014	50.064	50.216	0.544	450.960	1,084.119	786.240	230.362	241.040	32.045	2,925.590
2015	50.559	50.455	0.546	393.098	1,115.322	808.352	226.278	259.839	33.195	2,937.643
2016	50.989	50.638	0.546	360.370	1,123.208	810.908	250.282	260.893	35.719	2,943.552
2017	50.829	50.527	0.543	349.628	1,104.657	801.015	267.015	257.835	35.803	2,917.853
2018	51.199	50.877	0.506	332.749	1,219.708	806.461	276.986	256.987	35.530	3,031.004
2019	50.438	50.873	0.410	286.148	1,258.852	831.826	285.815	256.973	35.652	3,056.986
2020	50.803	51.228	0.414	231.959	1,224.600	813.399	303.457	249.982	31.846	2,957.689

Latin America Consumption

Figure A.9 Total and per capita energy consumption per source in Latin America 1820-2020 (Mtoe and koe)

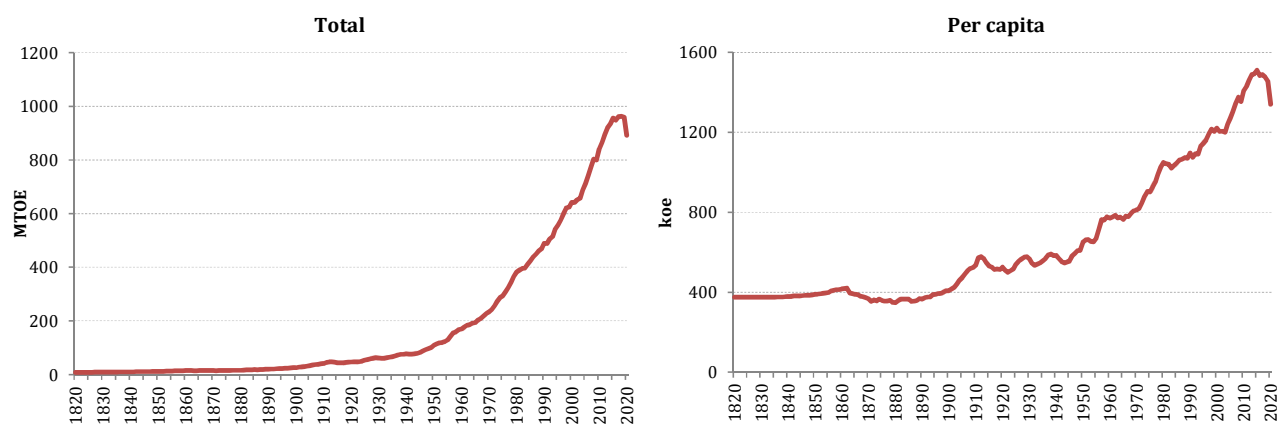


Table A.8 Total energy consumption per source in Latin America 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	1.668	3.476	2.653							7.798
1821	1.689	3.520	2.686							7.895
1822	1.710	3.564	2.720							7.994
1823	1.732	3.609	2.754							8.095
1824	1.754	3.654	2.789							8.197
1825	1.776	3.701	2.825							8.301
1826	1.799	3.748	2.860							8.407
1827	1.822	3.796	2.897							8.514
1828	1.845	3.844	2.934							8.624
1829	1.869	3.894	2.972							8.735
1830	1.893	3.944	3.010							8.847
1831	1.918	3.995	3.049							8.962
1832	1.943	4.047	3.089							9.078
1833	1.968	4.099	3.129							9.197
1834	1.994	4.153	3.170							9.317
1835	2.020	4.207	3.214							9.442
1836	2.047	4.263	3.271							9.581
1837	2.074	4.319	3.330							9.723
1838	2.102	4.376	3.390							9.868
1839	2.130	4.434	3.453							10.017
1840	2.158	4.494	3.518							10.170
1841	2.187	4.554	3.586	0.011						10.338
1842	2.217	4.615	3.656	0.037						10.525
1843	2.247	4.678	3.728	0.006						10.659
1844	2.278	4.741	3.803	0.005						10.827
1845	2.309	4.806	3.881	0.006						11.002
1846	2.341	4.872	3.961	0.007						11.181
1847	2.373	4.940	4.044	0.018						11.375
1848	2.407	5.009	4.130	0.023						11.569
1849	2.441	5.079	4.218	0.033						11.771
1850	2.475	5.152	4.310	0.045						11.982
1851	2.505	5.234	4.395	0.063						12.197

1852	2.536	5.318	4.482	0.050			12.386
1853	2.567	5.403	4.571	0.060			12.602
1854	2.598	5.490	4.663	0.055			12.807
1855	2.630	5.578	4.757	0.074			13.039
1856	2.663	5.668	4.854	0.268			13.452
1857	2.695	5.760	4.952	0.352			13.760
1858	2.729	5.853	5.054	0.371			14.007
1859	2.762	5.948	5.158	0.306			14.173
1860	2.797	6.044	5.264	0.377			14.482
1861	2.831	6.122	5.373	0.396			14.723
1862	2.867	6.202	5.485	0.424			14.977
1863	2.902	6.282	4.679	0.382			14.246
1864	2.939	6.364	4.535	0.507			14.344
1865	2.975	6.446	4.396	0.562			14.379
1866	3.013	6.531	4.261	0.709			14.513
1867	3.051	6.616	3.988	0.748			14.402
1868	3.089	6.703	3.832	0.830			14.454
1869	3.128	6.791	3.745	0.783			14.447
1870	3.168	6.880	3.603	0.785			14.436
1871	3.219	7.017	3.053	0.814			14.102
1872	3.271	7.156	3.206	1.032			14.666
1873	3.324	7.300	2.892	1.124			14.640
1874	3.379	7.446	3.173	1.249			15.248
1875	3.434	7.597	3.075	1.109			15.215
1876	3.491	7.752	2.995	1.072			15.310
1877	3.550	7.911	3.135	1.023			15.619
1878	3.610	8.074	3.227	1.036			15.948
1879	3.671	8.241	2.780	1.072			15.764
1880	3.733	8.413	2.628	1.167	0.001		15.942
1881	3.797	8.604	3.023	1.246	0.001		16.671
1882	3.862	8.800	3.375	1.276	0.005		17.319
1883	3.929	9.001	3.332	1.342	0.005		17.609
1884	3.997	9.207	3.209	1.492	0.006		17.912
1885	4.066	9.419	3.205	1.552	0.008		18.250
1886	4.135	9.631	2.648	1.464	0.007		17.884
1887	4.205	9.850	2.507	1.709	0.009		18.280
1888	4.278	10.075	2.321	2.068	0.007		18.749
1889	4.352	10.306	2.498	2.436	0.012		19.604
1890	4.427	10.545	2.591	2.141	0.021		19.725
1891	4.505	10.768	2.690	2.429	0.030		20.422
1892	4.583	10.996	2.796	2.641	0.022		21.038
1893	4.664	11.229	2.908	2.569	0.020		21.391
1894	4.746	11.468	3.028	3.111	0.020		22.373
1895	4.830	11.713	3.155	3.123	0.022	0.001	22.843
1896	4.916	11.964	3.291	3.299	0.021	0.001	23.491
1897	5.004	12.221	3.435	3.286	0.028	0.001	23.975
1898	5.093	12.485	3.589	3.560	0.037	0.001	24.766
1899	5.185	12.755	3.753	3.889	0.047	0.001	25.630
1900	5.279	13.033	3.928	3.753	0.050	0.002	26.044
1901	5.386	13.426	4.121	4.167	0.044	0.010	27.153
1902	5.487	13.812	4.285	4.449	0.048	0.010	28.091
1903	5.603	14.241	5.092	4.794	0.117	0.010	29.858
1904	5.708	14.649	6.072	5.056	0.126	0.011	31.622
1905	5.824	15.090	6.394	5.740	0.165	0.013	33.226
1906	5.950	15.568	6.806	6.629	0.226	0.014	35.193
1907	6.086	16.076	7.266	7.363	0.319	0.023	37.133
1908	6.208	16.557	7.751	7.253	0.795	0.045	38.609
1909	6.349	17.096	8.306	7.299	0.622	0.060	39.733
1910	6.496	17.669	8.576	8.017	0.781	0.077	41.617
1911	6.636	18.033	9.612	8.941	2.073	0.088	45.381
1912	6.791	18.438	11.027	8.888	1.517	0.112	46.772
1913	6.915	18.751	11.164	8.884	0.928	0.125	46.767

1914	7.005	18.994	11.022	7.639	0.785		0.145		45.589
1915	7.075	19.178	10.881	5.620	1.640		0.148		44.542
1916	7.133	19.333	9.949	5.271	2.694		0.149		44.530
1917	7.238	19.615	9.937	4.976	2.176		0.155		44.097
1918	7.366	19.958	10.155	4.816	2.609		0.157		45.061
1919	7.503	20.325	10.369	4.830	2.424		0.166		45.617
1920	7.622	20.642	10.011	5.803	3.096		0.176		47.350
1921	7.771	21.064	9.666	4.743	3.430		0.183		46.857
1922	7.926	21.505	9.372	5.001	2.763	0.055	0.193		46.816
1923	8.096	21.983	9.475	5.901	2.716	0.084	0.213		48.467
1924	8.268	22.470	9.511	6.750	3.017	0.112	0.241		50.369
1925	8.432	22.937	9.596	6.443	5.494	0.520	0.259		53.682
1926	8.610	23.440	10.114	6.215	7.003	0.580	0.295		56.256
1927	8.788	23.946	10.656	6.870	7.175	0.643	0.325		58.403
1928	8.951	24.414	11.203	6.370	8.680	0.709	0.349		60.677
1929	9.194	25.103	11.879	6.474	8.636	0.778	0.380		62.444
1930	9.318	25.464	12.424	6.400	7.284	0.846	0.398		62.134
1931	9.531	25.954	12.712	5.242	6.278	0.918	0.390		61.025
1932	9.709	26.349	12.940	4.785	5.289	1.439	0.382		60.892
1933	9.889	26.749	13.154	5.415	5.660	1.539	0.418		62.823
1934	10.074	27.158	13.385	5.666	6.149	1.673	0.455		64.559
1935	10.264	27.576	13.606	6.081	6.928	2.040	0.462		66.957
1936	10.459	28.007	13.850	6.458	8.153	2.134	0.507		69.567
1937	10.658	28.448	13.626	6.927	10.786	2.084	0.547		73.076
1938	10.860	28.892	13.913	6.736	11.373	2.700	0.609		75.083
1939	11.078	29.374	13.253	5.986	12.050	3.221	0.594		75.555
1940	11.278	29.808	13.374	5.812	12.761	3.313	0.620		76.966
1941	11.535	30.508	13.103	5.116	12.594	3.024	0.657		76.537
1942	11.793	31.213	12.934	4.601	11.971	2.785	0.723		76.021
1943	12.083	31.997	12.813	4.847	11.857	2.543	0.774		76.915
1944	12.340	32.705	12.488	4.807	13.018	2.915	0.810		79.081
1945	12.693	33.668	12.863	4.885	13.952	3.061	0.914		82.036
1946	13.058	34.659	12.977	5.339	17.996	3.204	0.973		88.204
1947	13.432	35.679	11.972	5.963	20.898	3.732	1.067		92.743
1948	13.821	36.729	11.998	6.246	23.647	3.570	1.211		97.222
1949	14.219	37.810	11.867	5.841	25.345	3.883	1.305		100.270
1950	14.659	38.924	11.876	6.260	32.001	4.722	1.366		109.808
1951	15.077	39.443	11.312	6.345	36.662	4.538	1.498		114.875
1952	15.492	39.976	11.785	6.372	38.159	4.738	1.689		118.211
1953	15.921	40.517	11.781	6.272	38.209	5.195	1.793		119.689
1954	16.521	41.065	11.324	6.425	39.999	5.572	1.913		122.818
1955	16.998	41.616	11.503	6.808	44.221	6.294	2.077		129.517
1956	17.469	42.171	13.931	7.363	52.255	6.648	2.402		142.239
1957	18.117	42.734	13.697	7.147	63.216	8.171	2.624		155.706
1958	18.701	43.307	13.991	7.184	63.071	10.249	3.024		159.527
1959	19.200	43.894	13.857	7.208	68.061	11.744	3.127		167.090
1960	19.599	43.619	13.727	7.729	69.552	12.760	3.312		170.299
1961	20.386	43.355	13.605	7.784	73.092	14.727	3.441		176.390
1962	20.911	43.099	13.494	7.933	77.857	16.231	3.748		183.273
1963	21.341	42.841	13.395	8.190	77.909	17.752	3.946		185.373
1964	22.276	42.575	13.304	8.413	81.192	19.301	4.336		191.397
1965	22.947	42.292	11.739	8.381	82.407	20.851	5.096		193.713
1966	23.579	41.993	11.752	8.989	89.920	21.329	5.670		203.232
1967	24.316	41.679	11.793	9.509	93.375	21.125	6.011		207.807
1968	25.095	41.352	11.857	9.508	101.273	22.402	6.461		217.948
1969	26.002	41.016	11.893	10.185	106.290	24.387	6.928		226.701
1970	26.719	40.674	11.943	10.126	110.799	24.684	8.494	0.311	233.749
1971	27.390	40.325	11.991	9.884	117.292	25.345	9.607	0.378	242.211
1972	28.005	39.969	12.054	9.930	127.546	27.110	10.849	0.458	255.922
1973	28.689	39.605	12.144	10.531	138.245	30.715	11.993	0.556	272.477
1974	29.921	39.231	12.253	11.763	146.982	32.510	13.453	0.304	287.092
1975	30.907	38.847	11.764	12.265	150.914	32.681	14.393	0.679	293.268

1976	31.726	38.453	11.319	12.475	160.824	35.836	16.120	0.695	0.993	308.440
1977	32.569	38.050	11.119	14.549	169.153	38.339	18.217	0.479	1.205	323.679
1978	33.617	37.640	10.955	13.872	183.784	42.037	20.358	0.847	1.462	344.571
1979	34.355	37.224	10.790	14.433	195.968	46.787	23.507	0.787	1.774	365.624
1980	35.748	36.803	10.621	15.430	205.656	49.397	25.804	0.683	2.166	382.308
1981	36.602	36.379	10.438	15.556	207.095	51.952	27.036	0.823	2.429	388.309
1982	37.195	35.950	10.245	15.488	206.987	56.385	29.758	0.550	3.373	395.928
1983	37.610	35.514	10.060	17.027	199.915	58.376	32.670	0.994	4.586	396.750
1984	38.254	35.071	9.883	19.335	201.957	61.293	36.706	1.839	6.558	410.896
1985	39.479	34.617	9.713	21.811	206.122	62.461	40.150	2.701	6.876	423.930
1986	40.288	34.154	9.540	21.949	217.791	63.075	43.756	1.728	6.100	438.380
1987	41.047	33.682	9.360	23.633	223.314	63.310	45.716	2.195	6.638	448.895
1988	41.942	33.204	9.176	23.369	229.516	67.061	47.888	1.890	6.823	460.869
1989	42.436	32.722	8.988	24.790	232.581	68.449	49.602	2.135	6.904	468.608
1990	42.917	33.335	8.803	20.329	252.081	71.921	50.013	3.673	6.100	489.172
1991	44.380	33.164	8.515	21.014	244.702	73.555	52.524	3.964	6.346	488.165
1992	45.410	33.517	8.380	21.870	255.809	75.367	54.901	3.765	6.201	505.220
1993	46.280	32.705	8.370	22.468	256.964	78.979	57.836	3.872	6.451	513.926
1994	47.558	32.877	8.651	22.999	276.303	82.815	60.152	3.698	6.879	541.933
1995	48.293	32.815	8.285	23.855	279.621	89.299	63.042	5.319	7.108	557.637
1996	49.370	32.932	8.581	25.054	285.155	96.120	65.619	5.240	7.398	575.470
1997	50.126	30.873	10.402	26.780	302.550	98.100	67.324	6.368	7.152	599.676
1998	50.957	32.111	10.087	26.501	315.794	104.390	67.841	5.892	7.023	620.596
1999	52.185	32.267	9.783	26.016	318.535	102.962	69.327	6.217	7.027	624.320
2000	53.555	33.247	9.490	26.971	326.526	109.357	70.668	6.027	6.107	641.948
2001	54.712	33.138	9.204	27.480	324.299	111.921	66.631	8.859	5.484	641.728
2002	55.282	33.813	8.927	31.766	320.328	116.543	70.050	8.662	6.171	651.543
2003	57.124	33.991	8.658	29.415	317.498	123.582	71.969	9.269	5.871	657.378
2004	58.067	34.833	8.400	30.794	328.574	136.520	75.705	8.443	6.529	687.865
2005	58.832	35.125	8.188	32.099	338.368	143.931	81.049	8.137	7.130	712.861
2006	60.007	35.306	7.949	36.206	345.330	155.935	83.617	9.555	6.769	740.673
2007	61.270	35.014	7.719	36.703	366.470	157.808	91.413	8.872	9.313	774.583
2008	62.671	35.608	7.497	37.307	377.613	161.777	98.314	9.212	12.469	802.469
2009	63.151	35.656	7.174	33.194	373.155	161.271	102.454	9.349	14.144	799.548
2010	64.512	36.483	6.961	40.726	389.379	170.512	108.211	8.152	15.892	840.830
2011	65.880	36.741	6.755	44.308	397.077	178.026	111.370	9.469	15.029	864.656
2012	66.303	36.438	6.556	44.081	415.152	190.146	111.280	9.184	14.727	893.867
2013	67.410	36.750	6.363	46.790	423.515	197.436	115.656	9.854	17.025	920.800
2014	69.359	35.049	6.176	48.411	420.291	202.769	123.464	9.077	18.818	933.414
2015	69.774	34.651	6.019	48.302	419.144	211.756	134.446	9.475	22.025	955.592
2016	70.484	35.796	5.855	47.195	405.904	213.603	138.800	9.832	20.524	947.992
2017	71.556	36.047	5.878	50.188	401.868	217.175	147.669	9.212	21.693	961.286
2018	72.619	36.406	5.936	47.727	393.967	212.621	160.194	9.020	24.630	963.119
2019	72.708	36.756	5.946	46.328	383.398	207.142	170.255	10.049	27.033	959.615
2020	73.383	37.100	6.001	37.599	337.085	191.854	171.449	10.394	26.167	891.033

Oceania Consumption

Figure A.10 Total and per capita energy consumption per source in Oceania 1820-2020 (Mtoe and koe)

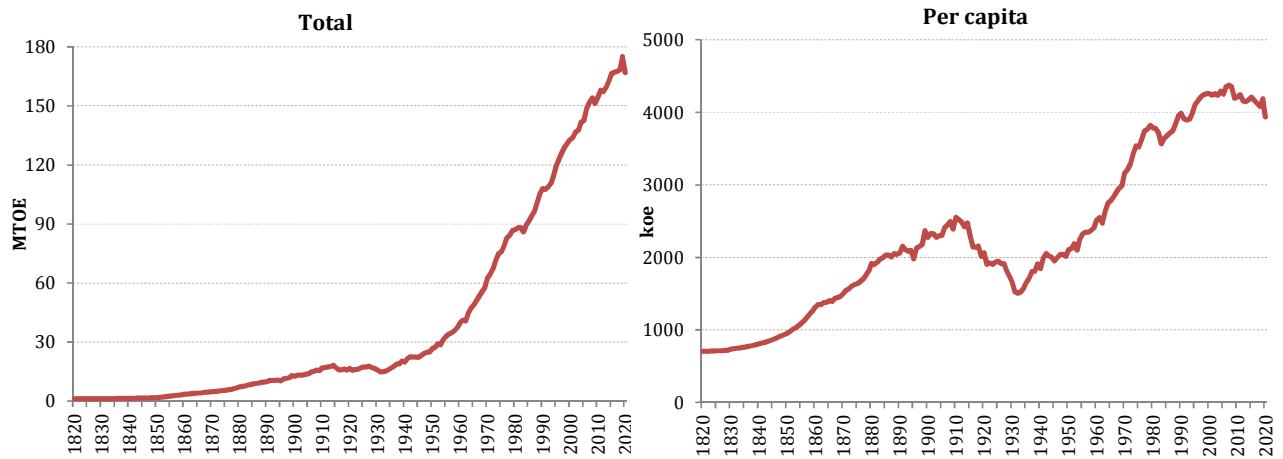


Table A.9 Total energy consumption per source in Oceania 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	0.128	1.000	0.014							1.142
1821	0.128	0.998	0.016							1.142
1822	0.129	0.998	0.017							1.144
1823	0.130	0.998	0.019							1.147
1824	0.130	1.000	0.022							1.152
1825	0.131	1.002	0.024							1.157
1826	0.131	1.000	0.027							1.159
1827	0.132	1.000	0.030							1.162
1828	0.132	0.999	0.034							1.165
1829	0.133	0.999	0.038							1.171
1830	0.134	1.002	0.043	0.017						1.196
1831	0.135	1.003	0.052	0.018						1.207
1832	0.135	1.004	0.058	0.020						1.217
1833	0.137	1.009	0.064	0.022						1.232
1834	0.138	1.011	0.071	0.024						1.244
1835	0.138	1.012	0.080	0.026						1.257
1836	0.139	1.016	0.089	0.029						1.274
1837	0.140	1.019	0.100	0.032						1.291
1838	0.142	1.027	0.111	0.035						1.315
1839	0.144	1.035	0.126	0.038						1.343
1840	0.147	1.044	0.139	0.042						1.372
1841	0.151	1.064	0.150	0.046						1.410
1842	0.153	1.077	0.165	0.050						1.445
1843	0.155	1.084	0.184	0.055						1.477
1844	0.157	1.092	0.205	0.061						1.514
1845	0.159	1.102	0.227	0.066						1.555
1846	0.161	1.112	0.253	0.073						1.598

1847	0.163	1.123	0.281	0.080		1.647
1848	0.166	1.138	0.310	0.088		1.702
1849	0.170	1.164	0.337	0.096		1.768
1850	0.174	1.185	0.371	0.105		1.836
1851	0.178	1.262	0.379	0.095		1.914
1852	0.185	1.374	0.376	0.109		2.043
1853	0.193	1.500	0.373	0.102		2.168
1854	0.202	1.642	0.371	0.109		2.325
1855	0.212	1.797	0.372	0.123		2.503
1856	0.220	1.952	0.377	0.122		2.671
1857	0.229	2.126	0.395	0.131		2.881
1858	0.237	2.301	0.409	0.138		3.086
1859	0.242	2.455	0.431	0.115		3.243
1860	0.248	2.654	0.453	0.094		3.449
1861	0.251	2.707	0.475	0.140		3.572
1862	0.255	2.778	0.502	0.094		3.628
1863	0.261	2.866	0.524	0.133		3.784
1864	0.268	2.970	0.551	0.112		3.901
1865	0.275	3.077	0.575	0.142		4.070
1866	0.282	3.174	0.600	0.061		4.117
1867	0.287	3.261	0.629	0.148		4.324
1868	0.294	3.367	0.654	0.134		4.448
1869	0.301	3.473	0.682	0.143		4.598
1870	0.305	3.556	0.714	0.203		4.778
1871	0.297	3.503	0.759	0.234		4.792
1872	0.305	3.615	0.791	0.238		4.948
1873	0.313	3.730	0.826	0.293		5.162
1874	0.321	3.875	0.859	0.301		5.355
1875	0.331	4.030	0.893	0.279		5.533
1876	0.338	4.180	0.936	0.314		5.767
1877	0.346	4.331	0.981	0.349		6.007
1878	0.356	4.488	1.037	0.477		6.358
1879	0.363	4.659	1.074	0.613		6.709
1880	0.373	4.843	1.121	0.927		7.265
1881	0.383	4.968	1.172	0.843		7.365
1882	0.388	5.098	1.224	0.956		7.667
1883	0.402	5.259	1.276	1.127		8.066
1884	0.414	5.441	1.330	1.220		8.405
1885	0.425	5.593	1.386	1.355		8.760
1886	0.434	5.738	1.440	1.366		8.977
1887	0.447	5.889	1.292	1.433		9.061
1888	0.456	6.039	1.354	1.640		9.489
1889	0.468	6.178	1.397	1.586		9.629
1890	0.474	6.314	1.449	1.665		9.902
1891	0.485	6.395	1.828	1.843		10.552
1892	0.487	6.465	1.659	1.894		10.505
1893	0.491	6.519	1.693	1.845		10.548
1894	0.499	6.571	1.698	1.999		10.766
1895	0.503	6.622	1.732	1.443		10.300
1896	0.513	6.670	1.974	2.100		11.257
1897	0.517	6.720	1.965	2.305		11.507
1898	0.529	6.760	1.960	2.559		11.808
1899	0.535	6.790	1.944	3.679	0.036	12.983
1900	0.543	6.820	1.935	3.280	0.036	12.613
1901	0.550	6.878	1.920	3.706	0.073	13.127
1902	0.559	6.940	1.939	3.828	0.038	13.304
1903	0.572	6.994	1.852	3.754	0.056	13.227
1904	0.583	7.055	1.892	3.988	0.057	13.575
1905	0.594	7.125	1.953	4.098	0.061	13.831
1906	0.608	7.196	2.047	4.826	0.063	14.739
1907	0.620	7.269	2.153	5.111	0.074	15.226
1908	0.631	7.351	2.272	5.499	0.070	15.822

1909	0.647	7.446	2.342	4.924	0.098			15.456
1910	0.665	7.551	2.444	6.104	0.107			16.872
1911	0.681	7.191	2.602	6.500	0.120			17.094
1912	0.702	6.882	2.710	6.936	0.162			17.391
1913	0.723	6.585	2.826	7.167	0.140			17.441
1914	0.738	6.247	2.925	8.152	0.148			18.210
1915	0.743	5.856	2.926	7.343	0.160			17.029
1916	0.744	5.445	2.788	6.758	0.203			15.938
1917	0.744	5.067	2.860	7.064	0.213			15.949
1918	0.752	4.775	2.925	7.673	0.183			16.308
1919	0.777	4.566	2.927	7.184	0.230			15.685
1920	0.803	4.488	2.790	8.197	0.289			16.566
1921	0.820	4.327	2.772	7.307	0.364			15.590
1922	0.838	4.173	2.786	7.828	0.461	0.011		16.097
1923	0.858	4.025	2.735	8.036	0.585	0.013		16.251
1924	0.878	3.881	2.665	8.690	0.743	0.015		16.872
1925	0.899	3.745	2.623	9.074	0.947	0.016		17.305
1926	0.917	3.611	2.566	9.111	1.143	0.026		17.373
1927	0.934	3.479	2.428	9.456	1.380	0.035		17.711
1928	0.950	3.346	2.351	8.731	1.667	0.042		17.086
1929	0.962	3.208	2.247	8.122	2.014	0.048		16.600
1930	0.965	3.121	2.151	7.694	1.966	0.064		15.960
1931	0.967	3.129	2.101	6.762	1.920	0.063		14.941
1932	0.980	3.132	2.072	6.769	1.874	0.062		14.889
1933	0.996	3.135	2.061	7.089	1.829	0.081		15.192
1934	1.010	3.137	2.060	7.554	2.025	0.084		15.870
1935	1.025	3.139	2.066	8.264	2.241	0.090		16.825
1936	1.041	3.141	2.070	8.757	2.480	0.097		17.586
1937	1.056	3.146	2.079	9.330	3.039	0.106		18.755
1938	1.071	3.153	2.065	9.105	3.469	0.122		18.984
1939	1.084	3.163	2.039	10.268	3.647	0.137		20.338
1940	1.100	3.171	2.015	9.560	3.836	0.137		19.819
1941	1.119	3.212	1.979	11.136	4.036	0.167		21.649
1942	1.156	3.257	1.928	11.724	4.246	0.176		22.487
1943	1.184	3.298	1.803	11.412	4.467	0.192		22.356
1944	1.214	3.350	1.736	11.221	4.701	0.202		22.423
1945	1.238	3.432	1.645	10.785	4.948	0.216		22.264
1946	1.297	3.515	1.535	11.507	5.207	0.222		23.284
1947	1.324	3.601	1.461	12.159	5.482	0.232		24.259
1948	1.402	3.689	1.439	12.261	5.771	0.244		24.805
1949	1.432	3.779	1.356	12.070	6.076	0.267		24.980
1950	1.463	3.871	1.271	13.357	6.398	0.286		26.646
1951	1.474	3.975	1.214	13.931	6.598	0.282		27.472
1952	1.508	4.072	1.148	15.229	6.804	0.321		29.083
1953	1.542	4.168	1.094	14.371	7.016	0.328		28.519
1954	1.602	4.265	1.026	15.321	8.691	0.388		31.292
1955	1.638	4.363	0.980	15.249	10.367	0.405		33.002
1956	1.675	4.466	0.929	15.457	11.018	0.446		33.990
1957	1.704	4.571	0.872	15.512	11.669	0.469		34.797
1958	1.743	4.680	0.817	15.781	12.425	0.530		35.976
1959	1.783	4.789	0.787	16.124	13.234	0.521		37.238
1960	1.789	4.751	0.756	17.607	14.098	0.105	0.599	39.706
1961	1.827	4.691	0.689	18.000	15.192	0.106	0.678	41.183
1962	1.865	4.630	0.653	16.956	15.773	0.103	0.767	40.746
1963	1.905	4.571	0.640	18.188	18.001	0.111	0.948	44.364
1964	1.947	4.515	0.588	18.986	20.034	0.109	1.042	47.221
1965	1.966	4.465	0.572	19.587	20.119	0.114	2.102	48.925
1966	2.050	4.420	0.487	20.192	21.646	0.114	2.150	51.060
1967	2.068	4.379	0.519	20.568	23.586	0.111	2.172	53.404
1968	2.131	4.338	0.282	21.050	25.485	0.115	2.322	55.724
1969	2.184	4.292	0.417	21.758	26.199	0.386	2.444	57.681
1970	2.250	4.243	0.517	21.973	29.239	1.646	2.547	62.414

1971	2.313	4.198	0.255	21.890	30.689	2.418	2.779		64.542
1972	2.381	4.150	0.079	22.839	31.463	3.520	2.958		67.391
1973	2.350	4.099	0.071	23.906	33.518	4.444	3.157		71.545
1974	2.327	4.044	0.079	24.932	34.999	5.078	3.533		74.992
1975	2.420	3.987	0.231	25.591	34.421	5.462	3.668		75.780
1976	2.472	3.927	0.375	26.455	35.224	6.860	3.704		79.017
1977	2.471	3.862	0.485	27.481	36.680	8.297	3.521		82.796
1978	2.466	3.796	0.504	28.050	36.980	8.736	3.724		84.257
1979	2.486	3.732	0.540	29.119	37.444	9.419	3.917		86.658
1980	2.559	3.674	0.566	29.969	35.716	10.619	3.952		87.056
1981	2.607	3.629	0.556	30.707	35.030	11.621	4.018		88.167
1982	2.677	3.591	0.531	30.997	34.501	12.130	3.825		88.251
1983	2.665	3.558	0.565	31.113	30.993	13.167	3.880		85.939
1984	2.752	3.528	0.572	32.735	32.008	13.537	4.097		89.229
1985	2.831	3.497	0.565	33.726	31.945	14.965	4.072		91.600
1986	2.844	3.465	0.552	34.721	31.562	16.686	4.342		94.171
1987	2.914	3.434	0.449	35.914	32.569	16.833	4.287		96.399
1988	2.969	3.403	0.478	37.811	33.976	17.457	4.555		100.649
1989	3.030	3.373	0.461	39.703	35.284	18.789	4.710		105.350
1990	3.122	3.425	0.449	40.587	36.611	18.847	4.927		107.969
1991	3.114	3.635	0.436	41.320	35.365	18.578	5.037		107.484
1992	3.164	3.178	0.422	41.677	36.149	19.335	4.864		108.789
1993	3.139	3.369	0.395	41.917	36.967	19.751	5.189		110.728
1994	3.192	3.040	0.408	42.678	38.805	21.139	5.356		114.618
1995	3.290	3.270	0.373	44.129	42.130	21.071	5.500		119.765
1996	3.308	3.483	0.356	45.844	42.982	21.757	5.428		123.159
1997	3.379	3.583	0.350	48.193	43.910	21.763	5.193		126.371
1998	3.339	3.901	0.350	50.168	43.978	21.726	5.549		129.010
1999	3.382	3.841	0.325	50.457	44.906	22.820	5.475		131.207
2000	3.418	4.481	0.325	50.583	45.021	23.408	5.679	0.055	132.970
2001	3.548	4.308	0.344	50.286	45.126	25.124	5.344	0.067	134.147
2002	3.600	4.151	0.313	51.358	45.769	25.447	5.906	0.068	136.612
2003	3.695	4.061	0.321	53.419	45.947	24.317	5.960	0.063	137.783
2004	3.699	3.920	0.348	55.695	46.911	24.378	6.808	0.047	141.805
2005	3.818	3.970	0.351	55.635	47.687	23.927	7.163	0.052	142.602
2006	3.938	4.225	0.375	57.013	49.085	26.355	7.587	0.081	148.658
2007	4.064	4.320	0.382	55.988	49.741	29.434	7.963	0.116	152.008
2008	4.138	4.010	0.374	58.666	49.989	28.730	8.007	0.154	154.069
2009	4.204	3.368	0.368	56.381	48.596	29.359	8.733	0.143	151.152
2010	4.302	3.529	0.368	55.211	49.132	31.956	9.619	0.201	154.318
2011	4.460	3.474	0.371	53.870	51.571	32.605	11.383	0.243	157.977
2012	4.534	3.435	0.207	50.895	53.032	33.146	11.779	0.235	157.262
2013	4.665	3.412	0.140	48.184	54.534	34.856	13.181	0.281	159.252
2014	4.808	3.453	0.100	47.677	54.774	37.584	13.874	0.322	162.591
2015	4.865	3.426	0.072	49.332	54.728	38.668	15.141	0.236	166.469
2016	4.968	3.650	0.071	49.046	55.072	37.789	16.276	0.205	167.077
2017	5.027	3.718	0.072	47.469	57.731	37.288	16.130	0.183	167.618
2018	5.079	3.767	0.073	46.447	58.563	35.717	18.625	0.152	168.423
2019	5.166	3.764	0.061	44.737	58.297	41.619	21.295	0.141	175.081
2020	5.235	3.812	0.062	43.053	50.286	40.261	24.036	0.145	166.890

Asia Consumption

Figure A.11 Total and per capita energy consumption per source in Asia 1820-2020 (Mtoe and koe)

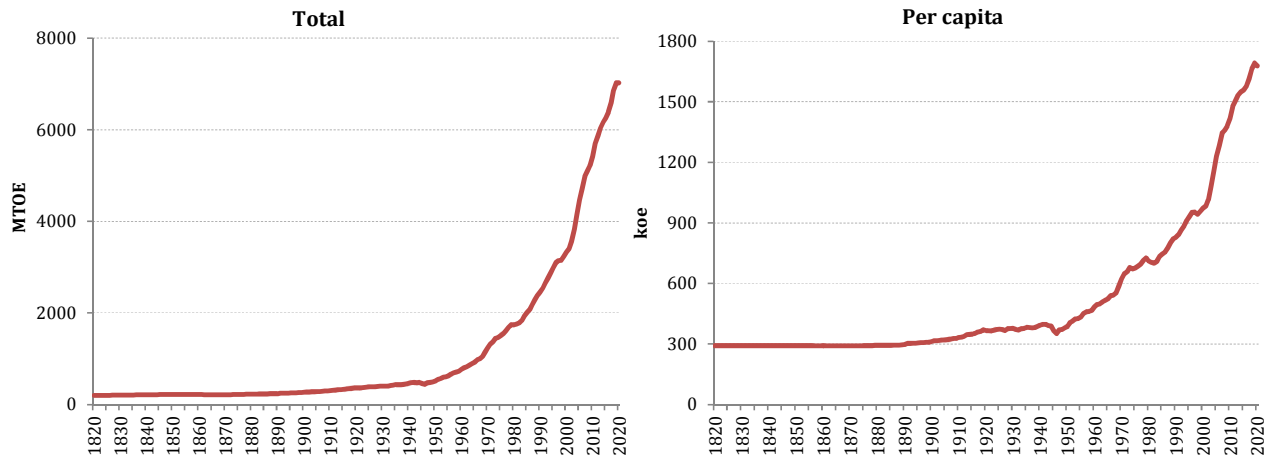


Table A.10 Total energy consumption per source in Asia 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	54.760	108.294	34.895	2.065						200.014
1821	54.934	108.648	35.009	2.074						200.665
1822	55.109	109.002	35.123	2.084						201.318
1823	55.284	109.358	35.237	2.093						201.973
1824	55.460	109.715	35.352	2.102						202.630
1825	55.637	110.073	35.468	2.112						203.289
1826	55.814	110.432	35.583	2.121						203.950
1827	55.991	110.792	35.700	2.131						204.614
1828	56.170	111.154	35.816	2.140						205.280
1829	56.348	111.516	35.933	2.150						205.948
1830	56.528	111.880	36.050	2.160						206.618
1831	56.708	112.245	36.168	2.164						207.284
1832	56.888	112.611	36.286	2.168						207.953
1833	57.069	112.979	36.404	2.172						208.624
1834	57.251	113.348	36.523	2.176						209.297
1835	57.433	113.717	36.642	2.180						209.973
1836	57.616	114.088	36.762	2.184						210.650
1837	57.799	114.461	36.882	2.188						211.330
1838	57.983	114.834	37.002	2.192						212.011
1839	58.168	115.209	37.123	2.196						212.695
1840	58.353	115.585	37.244	2.200						213.382
1841	58.539	115.962	37.365	2.204						214.069
1842	58.725	116.340	37.487	2.207						214.759
1843	58.912	116.720	37.610	2.210						215.452
1844	59.099	117.101	37.732	2.214						216.146
1845	59.287	117.483	37.855	2.217						216.843
1846	59.476	117.866	37.979	2.220						217.542
1847	59.665	118.251	38.103	2.224						218.243
1848	59.855	118.636	38.227	2.227						218.946

1849	60.046	119.024	38.352	2.230		219.652
1850	60.237	119.412	38.477	2.234		220.360
1851	60.149	119.199	38.424	2.218		219.990
1852	60.061	118.986	38.371	2.203		219.620
1853	59.973	118.774	38.317	2.187		219.251
1854	59.885	118.562	38.264	2.172		218.883
1855	59.797	118.350	38.211	2.156		218.515
1856	59.710	118.139	38.158	2.141		218.148
1857	59.622	117.928	38.106	2.125		217.781
1858	59.535	117.718	38.053	2.110		217.415
1859	59.448	117.507	38.000	2.094		217.049
1860	59.361	117.298	37.947	2.341		216.947
1861	59.274	117.051	37.895	2.343		216.563
1862	59.187	116.806	37.842	2.346		216.181
1863	59.100	116.560	37.790	2.349		215.800
1864	59.014	116.315	37.738	2.354		215.420
1865	58.927	116.071	37.685	2.359		215.043
1866	58.841	115.827	37.633	2.365		214.667
1867	58.755	115.584	37.581	2.373		214.292
1868	58.668	115.341	37.529	2.384		213.923
1869	58.583	115.099	37.477	2.396		213.554
1870	58.497	114.858	37.425	2.405		213.185
1871	58.823	115.474	37.603	2.440		214.341
1872	59.152	116.094	37.782	2.476		215.503
1873	59.482	116.717	37.962	2.511		216.672
1874	59.815	117.343	38.143	2.705		218.005
1875	60.149	117.973	38.324	3.019		219.465
1876	60.485	118.606	38.506	3.050		220.647
1877	60.822	119.243	38.690	3.058		221.813
1878	61.162	119.882	38.874	3.255		223.173
1879	61.504	120.526	39.059	3.430	0.023	224.542
1880	61.847	121.173	39.245	3.495	0.036	225.796
1881	62.193	121.746	39.405	3.579	0.032	226.954
1882	62.540	122.321	39.565	3.618	0.071	228.115
1883	62.889	122.899	39.727	3.716	0.048	229.279
1884	63.240	123.480	39.890	3.857	0.093	230.561
1885	63.594	124.064	40.053	4.028	0.066	231.805
1886	63.949	124.651	40.217	4.138	0.111	233.066
1887	64.306	125.240	40.383	4.477	0.106	234.512
1888	64.665	125.832	40.549	4.737	0.134	235.917
1889	65.026	126.427	40.716	5.072	0.194	237.435
1890	65.390	127.025	41.846	5.308	0.199	239.767
1891	65.813	127.710	46.548	5.853	0.216	246.140
1892	66.238	128.399	46.785	6.046	0.251	247.719
1893	66.667	129.092	47.024	6.169	0.420	249.372
1894	67.098	129.789	47.264	7.113	0.331	251.595
1895	67.532	130.489	47.003	7.765	0.454	253.244
1896	67.969	131.193	47.749	8.385	0.502	255.798
1897	68.409	131.901	47.993	8.667	0.751	257.721
1898	68.851	132.613	48.239	10.132	0.798	260.633
1899	69.297	133.328	48.487	10.471	0.680	262.263
1900	69.745	134.048	50.251	11.647	0.866	266.558
1901	70.306	134.994	51.957	13.125	1.277	271.658
1902	70.871	135.947	52.309	14.133	1.046	274.306
1903	71.441	136.907	52.664	14.504	1.611	277.127
1904	72.015	137.873	53.022	15.852	1.926	280.689
1905	72.594	138.846	53.383	16.363	2.142	283.328
1906	73.178	139.826	53.746	18.278	2.320	287.348
1907	73.766	140.813	54.111	20.039	2.596	291.325
1908	74.359	141.807	54.480	22.357	2.761	295.764
1909	74.957	142.808	54.851	22.997	3.144	298.757
1910	75.559	143.816	58.909	23.815	2.638	304.737

1911	76.167	144.603	58.692	26.405	2.911				308.777
1912	76.779	145.394	59.077	31.583	2.540				315.373
1913	77.407	146.190	62.617	36.139	2.764				325.117
1914	77.940	146.966	63.022	37.980	2.822				328.729
1915	78.475	147.747	66.625	36.565	2.774		0.130		332.317
1916	79.015	148.531	67.058	40.459	2.946		0.166		338.175
1917	79.558	149.320	70.737	44.428	2.847		0.193		347.083
1918	80.105	150.113	71.199	48.003	2.848		0.229		352.498
1919	80.656	150.910	71.666	56.086	2.997		0.271		362.585
1920	81.210	151.714	74.199	49.968	3.124		0.296		360.512
1921	81.934	152.909	76.108	48.106	3.243	0.076	0.328		362.705
1922	82.665	154.113	76.776	49.363	3.331	0.112	0.373		366.734
1923	83.402	155.327	77.450	53.512	3.675	0.207	0.408		373.981
1924	84.145	156.551	78.131	56.943	3.974	0.254	0.443		380.441
1925	84.896	157.784	78.817	57.828	4.564	0.355	0.609		384.854
1926	85.653	159.027	79.510	56.991	4.300	0.304	0.705		386.490
1927	86.416	160.280	80.209	51.953	5.259	0.313	0.923		385.352
1928	87.187	161.542	80.914	61.543	5.351	0.410	1.076		398.023
1929	88.490	162.815	81.626	62.929	5.906	0.459	1.312		403.536
1930	89.284	164.098	83.044	62.003	6.602	0.464	1.344		406.839
1931	90.086	165.172	83.070	58.027	6.780	0.705	1.448		405.287
1932	90.895	166.252	83.793	55.727	6.937	0.739	1.489		405.832
1933	88.716	167.339	89.571	62.889	6.076	0.844	1.656		417.091
1934	91.451	168.434	85.260	67.076	6.978	0.898	1.732		421.829
1935	92.277	169.535	86.004	72.909	7.806	0.908	1.774		431.214
1936	93.110	170.644	86.755	76.780	3.816	0.872	2.022		434.000
1937	93.950	171.760	83.605	78.806	5.064	0.947	2.260		436.392
1938	94.798	172.884	84.381	81.683	4.969	1.013	2.368		442.096
1939	95.653	174.015	85.118	88.370	5.397	1.039	2.521		452.112
1940	96.517	175.159	85.860	99.329	4.230	1.072	2.454		464.621
1941	97.606	177.010	86.804	107.067	3.814	0.045	2.523		474.869
1942	98.708	178.880	87.759	108.221	4.047	0.044	3.061		480.721
1943	99.823	180.770	88.725	101.878	3.550	0.042	2.824		477.612
1944	100.949	182.679	89.702	100.173	4.196	0.041	3.116		480.857
1945	102.028	184.502	96.752	64.295	4.810	0.040	3.268		455.694
1946	103.119	186.342	96.833	49.511	4.591	0.039	2.435		442.870
1947	104.192	188.201	109.906	61.850	5.535	0.071	3.546		473.301
1948	105.271	188.225	110.045	66.367	5.757	0.464	3.725		479.854
1949	106.316	190.091	107.463	80.760	5.911	0.716	4.159		495.416
1950	107.459	192.006	110.222	86.315	9.097	0.750	4.546		510.394
1951	109.657	194.209	126.475	99.501	13.009	0.946	4.768		548.565
1952	111.999	197.904	128.154	110.549	13.462	1.263	4.801		568.133
1953	114.425	201.446	128.883	124.081	17.441	1.605	5.084		592.965
1954	116.634	203.064	129.586	128.989	20.103	1.868	5.533		605.777
1955	118.812	206.581	130.316	138.738	24.798	2.364	5.970		627.578
1956	121.035	215.998	134.971	154.549	29.191	2.674	6.448		664.865
1957	118.873	219.788	130.962	176.389	34.604	2.991	6.979		690.586
1958	121.170	223.728	129.233	183.808	36.948	3.111	7.676		705.674
1959	123.538	227.818	129.972	185.829	46.874	3.495	8.659		726.186
1960	121.351	231.558	142.726	200.017	60.761	2.638	9.302		768.352
1961	124.497	234.658	140.252	213.701	78.039	3.217	9.304		803.669
1962	131.027	237.915	129.798	221.802	89.980	3.853	10.665		825.038
1963	134.104	241.400	133.989	225.560	108.185	4.625	10.610		858.473
1964	138.516	245.177	134.808	226.959	128.222	4.933	12.099		890.712
1965	141.461	249.289	131.885	235.050	149.179	5.059	13.028		924.951
1966	145.273	253.759	137.514	248.027	169.719	5.440	14.307	0.126	974.164
1967	148.423	258.535	138.694	239.066	198.812	5.630	13.107	0.288	1,002.553
1968	152.382	263.522	139.828	241.884	228.629	6.031	13.992	0.245	1,046.512
1969	159.352	268.591	141.216	276.161	271.509	6.782	15.172	0.564	1,139.347
1970	163.545	273.659	143.151	313.060	319.130	8.556	15.351	1.567	1,238.020
1971	168.080	277.360	148.513	336.873	359.681	9.843	17.032	2.739	1,320.120
1972	172.402	280.952	146.542	350.823	388.366	11.044	17.833	3.293	1,371.255

1973	177.098	284.392	147.583	356.798	446.580	13.277	16.977	3.884		1,446.589
1974	177.578	287.657	148.590	364.391	443.463	17.431	18.534	6.914		1,464.559
1975	192.011	290.723	141.205	394.660	437.822	21.838	19.660	8.099		1,506.018
1976	196.418	293.575	139.966	402.677	465.215	25.231	20.314	13.395		1,556.792
1977	192.304	296.232	143.470	430.328	485.281	32.607	19.643	10.220		1,610.085
1978	196.540	298.767	143.964	453.136	509.890	42.658	20.186	18.511		1,683.651
1979	213.096	301.268	143.014	473.131	520.164	49.703	22.365	21.940		1,744.680
1980	214.975	303.919	132.264	500.872	484.987	51.929	24.947	29.070		1,742.961
1981	219.909	307.983	135.782	516.801	468.356	51.187	27.285	30.141		1,757.442
1982	225.333	312.072	133.100	535.911	453.630	53.203	30.142	37.014		1,780.405
1983	230.626	316.343	135.248	565.385	458.299	59.704	33.037	38.330		1,836.971
1984	240.021	320.719	130.156	615.718	478.630	73.788	32.951	44.894		1,936.878
1985	241.403	325.281	130.902	667.596	471.195	80.681	35.487	53.798		2,006.343
1986	247.591	330.051	131.779	693.722	486.067	88.118	35.883	59.070		2,072.279
1987	255.706	334.983	135.018	751.667	501.161	92.329	36.198	67.198		2,174.259
1988	262.320	339.954	135.912	809.416	541.676	98.741	39.538	62.602		2,290.158
1989	270.032	344.797	136.779	852.438	571.435	106.027	43.676	66.060		2,391.244
1990	267.891	349.809	138.165	877.561	597.776	113.465	42.497	70.126		2,457.290
1991	268.569	352.781	138.875	918.836	619.605	126.489	44.132	74.612		2,543.898
1992	276.230	355.420	147.636	959.669	655.776	134.226	43.178	78.090		2,650.224
1993	285.245	357.791	147.968	1,015.094	675.790	138.587	47.323	89.333		2,757.130
1994	295.405	359.890	148.460	1,075.348	710.775	150.081	49.006	97.296		2,886.262
1995	306.985	362.060	148.723	1,101.076	749.990	156.900	54.640	107.451		2,987.825
1996	312.674	363.979	149.245	1,149.855	788.110	169.345	53.697	111.622		3,098.528
1997	318.343	365.996	132.288	1,145.891	821.797	183.290	56.507	120.608		3,144.720
1998	324.968	367.622	132.803	1,138.838	810.752	188.499	61.009	122.796		3,147.288
1999	329.375	369.390	133.255	1,171.133	848.603	201.315	61.111	120.223		3,234.404
2000	336.165	370.972	131.128	1,206.617	878.688	217.021	64.376	122.619	0.116	3,327.701
2001	339.625	371.400	131.647	1,261.822	877.551	227.038	70.947	124.469	0.119	3,404.620
2002	344.345	370.572	132.519	1,367.272	908.014	235.766	72.529	125.214	1.143	3,557.373
2003	348.867	369.730	132.936	1,581.147	960.830	258.233	74.500	101.764	1.408	3,829.415
2004	354.974	368.634	133.470	1,797.137	1,028.334	264.055	86.916	123.211	1.617	4,158.347
2005	360.883	367.458	125.875	2,068.343	1,031.552	285.922	95.660	127.060	1.968	4,464.720
2006	366.417	365.968	126.418	2,242.844	1,053.190	308.211	107.529	131.846	2.510	4,704.932
2007	375.346	364.899	133.676	2,446.658	1,084.511	334.387	117.028	125.419	2.754	4,984.678
2008	383.586	363.689	134.183	2,502.994	1,087.119	361.604	141.326	117.196	3.669	5,095.366
2009	378.439	362.534	133.238	2,602.551	1,089.662	373.181	149.555	130.864	4.294	5,224.317
2010	386.095	320.608	123.296	2,701.503	1,160.693	412.651	174.935	135.033	4.916	5,419.728
2011	392.821	320.486	123.807	2,911.354	1,202.099	454.692	191.446	97.711	5.569	5,699.985
2012	398.736	319.961	124.327	2,991.009	1,269.100	486.769	227.178	51.597	6.648	5,875.325
2013	403.213	302.384	124.847	3,083.011	1,289.944	506.675	265.024	55.467	8.172	6,038.738
2014	409.297	301.838	125.355	3,115.577	1,308.824	526.019	307.815	58.194	10.279	6,163.197
2015	415.545	301.080	124.489	3,092.870	1,366.208	530.649	345.573	71.688	8.730	6,256.833
2016	417.744	298.580	123.387	3,089.437	1,414.738	544.230	397.426	89.487	11.418	6,386.445
2017	423.167	289.044	124.511	3,132.300	1,462.694	579.661	465.816	104.217	10.871	6,592.280
2018	428.377	291.143	125.544	3,197.518	1,497.163	629.271	541.835	126.290	13.632	6,850.773
2019	437.605	284.669	118.380	3,233.891	1,525.342	649.145	609.636	151.015	17.588	7,027.271
2020	440.864	286.709	119.331	3,211.047	1,471.500	655.411	671.854	148.724	17.549	7,022.988

Middle East Consumption

Figure A.12 Total and per capita energy consumption per source in Middle East 1820-2020 (Mtoe and koe)

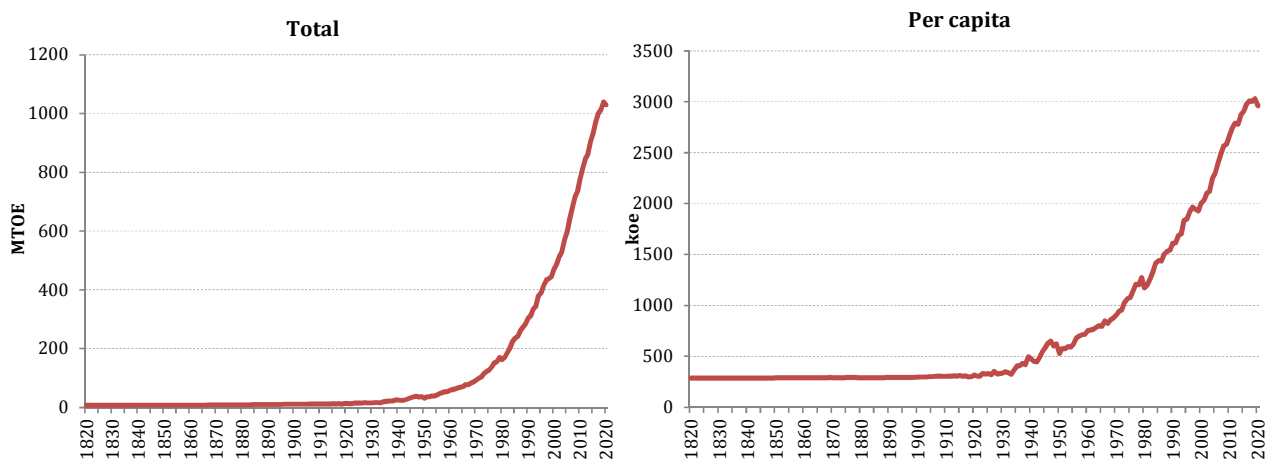


Table A.11 Total energy consumption per source in Middle East 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	2.037	3.530	1.619							7.186
1821	2.045	3.543	1.624							7.213
1822	2.054	3.557	1.630							7.240
1823	2.062	3.570	1.636							7.268
1824	2.071	3.584	1.641							7.296
1825	2.079	3.597	1.647							7.323
1826	2.088	3.611	1.653							7.351
1827	2.096	3.625	1.658							7.379
1828	2.105	3.638	1.664							7.407
1829	2.113	3.652	1.670							7.435
1830	2.122	3.666	1.676							7.464
1831	2.131	3.680	1.682							7.492
1832	2.139	3.694	1.687							7.521
1833	2.148	3.708	1.693							7.549
1834	2.157	3.722	1.699							7.578
1835	2.166	3.736	1.705							7.607
1836	2.175	3.750	1.711							7.636
1837	2.184	3.764	1.717							7.665
1838	2.193	3.778	1.723							7.694
1839	2.201	3.793	1.729							7.723
1840	2.210	3.807	1.735							7.752
1841	2.220	3.822	1.741							7.782
1842	2.229	3.836	1.747							7.811
1843	2.238	3.850	1.753							7.841
1844	2.247	3.865	1.759							7.871
1845	2.256	3.880	1.765							7.901
1846	2.265	3.894	1.771							7.931
1847	2.275	3.909	1.777							7.961

1848	2.284	3.924	1.783		7.991
1849	2.293	3.939	1.790		8.022
1850	2.303	3.954	1.796		8.052
1851	2.311	3.967	1.801		8.080
1852	2.320	3.981	1.807		8.108
1853	2.329	3.995	1.813		8.136
1854	2.338	4.009	1.818		8.165
1855	2.346	4.022	1.824		8.193
1856	2.355	4.036	1.830		8.221
1857	2.364	4.050	1.836		8.250
1858	2.373	4.064	1.841		8.279
1859	2.382	4.078	1.847		8.307
1860	2.391	4.092	1.853		8.336
1861	2.400	4.107	1.859		8.365
1862	2.409	4.121	1.865		8.394
1863	2.418	4.135	1.870		8.423
1864	2.427	4.149	1.876		8.453
1865	2.436	4.164	1.882	0.044	8.526
1866	2.445	4.178	1.888	0.062	8.573
1867	2.455	4.192	1.894	0.067	8.608
1868	2.464	4.207	1.900	0.052	8.622
1869	2.473	4.221	1.906	0.079	8.679
1870	2.482	4.236	1.912	0.047	8.677
1871	2.502	4.264	1.925	0.059	8.750
1872	2.522	4.292	1.938	0.073	8.824
1873	2.542	4.320	1.951	0.071	8.884
1874	2.562	4.348	1.964	0.077	8.951
1875	2.582	4.377	1.978	0.105	9.041
1876	2.603	4.406	1.991	0.082	9.082
1877	2.623	4.435	2.005	0.133	9.196
1878	2.644	4.464	2.018	0.098	9.224
1879	2.665	4.493	2.032	0.038	9.228
1880	2.686	4.523	2.046	0.041	9.296
1881	2.707	4.552	2.060	0.055	9.373
1882	2.729	4.581	2.074	0.046	9.429
1883	2.750	4.611	2.088	0.048	9.497
1884	2.772	4.640	2.102	0.052	9.567
1885	2.794	4.670	2.116	0.058	9.639
1886	2.816	4.701	2.130	0.041	9.687
1887	2.838	4.731	2.145	0.074	9.788
1888	2.861	4.761	2.159	0.080	9.861
1889	2.883	4.792	2.174	0.120	9.970
1890	2.906	4.823	2.189	0.110	10.028
1891	2.929	4.858	2.204	0.121	10.112
1892	2.952	4.893	2.219	0.123	10.187
1893	2.975	4.929	2.234	0.128	10.266
1894	2.999	4.964	2.249	0.118	10.330
1895	3.023	5.000	2.264	0.112	10.399
1896	3.047	5.037	2.279	0.133	10.496
1897	3.071	5.073	2.295	0.095	10.534
1898	3.095	5.110	2.311	0.158	10.673
1899	3.119	5.147	2.326	0.201	10.794
1900	3.144	5.185	2.342	0.200	10.871
1901	3.160	5.211	2.351	0.310	11.032
1902	3.175	5.237	2.360	0.286	11.058
1903	3.191	5.264	2.369	0.333	11.157
1904	3.207	5.291	2.378	0.380	11.256
1905	3.223	5.318	2.387	0.433	11.361
1906	3.239	5.345	2.396	0.444	11.424
1907	3.255	5.372	2.405	0.540	11.572
1908	3.271	5.400	2.414	0.558	11.643
1909	3.287	5.427	2.424	0.488	11.626

1910	3.303	5.455	2.433	0.506				11.697
1911	3.320	5.475	2.442	0.518	0.049			11.804
1912	3.336	5.495	2.451	0.534	0.090			11.906
1913	3.353	5.515	2.461	0.621	0.066			12.015
1914	3.397	5.577	2.481	0.491	0.125			12.072
1915	3.441	5.640	2.502	0.372	0.431			12.386
1916	3.485	5.704	2.523	0.184	0.280			12.176
1917	3.530	5.768	2.544	0.281	0.436			12.560
1918	3.576	5.833	2.566	0.273	0.077			12.325
1919	3.623	5.899	2.587	0.435	0.000			12.544
1920	3.670	5.966	2.609	0.413	0.682			13.339
1921	3.717	6.039	2.630	0.269	0.369			13.025
1922	3.765	6.114	2.652	0.326	0.325			13.183
1923	3.814	6.190	2.674	0.477	1.453			14.608
1924	3.864	6.266	2.703	0.616	0.888			14.337
1925	3.914	6.344	2.732	0.652	1.172			14.813
1926	3.964	6.422	2.761	0.835	0.420			14.402
1927	4.016	6.501	2.791	0.871	1.919			16.099
1928	4.068	6.582	2.825	0.722	1.041			15.238
1929	4.121	6.663	3.012	0.769	0.920			15.485
1930	4.174	6.745	3.044	0.918	1.088			15.970
1931	4.228	6.802	3.094	0.892	1.764			16.779
1932	4.283	6.858	3.294	0.903	1.135			16.473
1933	4.339	6.916	3.217	1.133	0.262			15.867
1934	4.395	6.973	3.254	1.590	2.010			18.223
1935	4.452	7.031	3.716	1.704	3.553			20.456
1936	4.510	7.090	4.467	1.726	3.037			20.830
1937	4.568	7.149	4.659	1.776	3.984	0.003		22.140
1938	4.627	7.209	4.846	1.210	3.889	0.001		21.783
1939	4.687	7.269	4.845	1.732	7.621	0.003		26.157
1940	4.748	7.330	5.049	1.939	6.360	0.003		25.430
1941	4.810	7.406	5.177	1.988	5.064	0.004		24.449
1942	4.872	7.483	5.060	1.751	5.112	0.005		24.283
1943	4.935	7.561	5.026	2.149	7.316	0.006		26.994
1944	4.999	7.640	5.151	1.604	10.978	0.007		30.378
1945	5.071	7.730	5.306	2.536	12.320	0.006		32.969
1946	5.144	7.821	5.128	2.500	15.536	0.008		36.136
1947	5.218	7.914	5.192	2.668	16.821	0.008		37.821
1948	5.293	8.007	5.458	2.696	13.915	0.009		35.378
1949	5.369	8.102	5.591	2.776	15.348	0.009		37.194
1950	5.448	8.197	5.679	2.826	9.742	0.009		31.901
1951	5.609	8.372	5.833	2.921	13.049	0.009		35.791
1952	5.793	8.551	6.175	2.922	13.021	0.010		36.472
1953	5.965	8.735	6.215	3.526	14.315	0.059	0.012	38.828
1954	6.134	8.924	6.265	3.688	14.064	0.352	0.015	39.441
1955	6.395	9.116	6.429	3.562	16.290	0.766	0.016	42.574
1956	6.574	9.313	6.621	3.754	20.557	0.971	0.024	47.814
1957	6.868	9.514	6.798	4.185	21.792	1.207	0.041	50.405
1958	7.061	9.721	6.984	4.339	23.456	1.165	0.075	52.800
1959	7.373	9.934	7.220	4.242	23.951	1.507	0.113	54.340
1960	7.580	9.663	7.047	3.944	28.456	1.880	0.194	58.765
1961	7.891	9.402	7.101	3.907	30.230	1.965	0.277	60.773
1962	8.054	9.151	7.172	4.173	32.146	2.078	0.331	63.104
1963	8.431	8.907	7.101	4.613	34.457	2.281	0.489	66.280
1964	8.668	8.672	7.255	5.065	36.490	3.162	0.213	69.526
1965	8.887	8.443	7.275	4.504	38.593	2.630	0.479	70.810
1966	9.327	8.220	7.431	5.003	44.114	3.069	0.521	77.686
1967	9.490	8.005	7.575	4.492	44.160	3.220	0.564	77.506
1968	9.807	7.796	7.544	4.886	48.827	3.579	0.673	83.112
1969	10.040	7.595	7.464	5.202	52.466	3.416	0.723	86.907
1970	10.479	7.402	7.392	5.761	54.981	5.408	0.698	92.122
1971	10.947	7.217	7.237	5.797	61.439	5.778	0.675	99.089

1972	11.344	7.039	7.267	6.355	64.244	6.469	0.840		103.559	
1973	11.497	6.868	7.410	6.795	73.880	7.411	0.729		114.589	
1974	11.773	6.704	7.474	7.425	80.268	7.873	0.899		122.417	
1975	12.426	6.545	7.645	8.377	82.344	8.850	1.260		127.449	
1976	13.034	6.392	7.801	8.703	91.149	10.163	1.611		138.853	
1977	13.361	6.244	7.885	8.937	102.845	10.792	1.740		151.803	
1978	13.863	6.103	7.901	8.457	106.210	11.078	2.093		155.706	
1979	14.652	5.969	8.034	9.034	116.099	14.334	2.172		170.294	
1980	15.476	5.844	8.064	9.536	104.813	15.946	2.288		161.966	
1981	15.813	5.726	8.348	9.468	112.827	17.051	2.470		171.703	
1982	16.555	5.614	8.409	11.531	121.932	19.829	2.662		186.533	
1983	17.245	5.504	8.080	12.950	136.722	20.491	2.319		203.311	
1984	17.723	5.394	7.864	14.646	147.253	28.199	2.574		223.653	
1985	18.794	5.281	7.425	17.077	154.284	29.768	2.424		235.052	
1986	19.377	5.165	7.071	18.685	152.524	36.259	2.494		241.574	
1987	20.295	5.047	7.066	19.736	163.651	41.537	3.564		260.894	
1988	20.954	4.925	6.926	19.191	169.571	47.121	4.772		273.460	
1989	21.822	4.799	7.349	21.106	171.059	54.320	3.376		283.831	
1990	22.490	4.927	7.077	22.234	178.695	64.585	4.244		304.252	
1991	22.301	4.953	6.653	24.164	181.145	69.283	3.739		312.238	
1992	22.785	4.990	6.760	24.676	192.664	77.288	4.916		334.080	
1993	23.482	5.026	6.942	24.053	213.269	66.117	6.033		344.922	
1994	23.832	5.103	7.060	24.530	234.276	79.955	5.285		380.041	
1995	24.333	4.890	7.089	25.767	235.365	86.905	6.195		390.544	
1996	24.886	4.969	7.080	29.408	245.416	96.608	6.743		415.109	
1997	25.288	5.001	7.112	32.661	254.955	102.317	6.430		433.764	
1998	25.939	5.095	6.958	34.460	246.463	112.631	6.867		438.415	
1999	26.503	4.898	6.736	32.477	244.458	123.859	5.439		444.370	
2000	27.130	4.755	6.752	36.173	257.267	134.456	4.881		471.414	
2001	27.630	4.575	6.674	32.545	265.526	146.432	4.237		487.619	
2002	28.028	4.416	6.681	34.023	270.069	164.671	5.784		513.672	
2003	28.432	4.250	6.519	36.435	274.659	173.337	6.203		529.835	
2004	29.355	4.089	6.558	38.250	290.870	195.068	8.025		572.215	
2005	29.961	5.695	6.541	38.660	300.390	209.608	7.524	0.020	598.397	
2006	30.697	5.565	6.451	43.558	318.013	226.437	8.610	0.054	639.385	
2007	31.399	4.722	6.615	48.176	329.593	250.553	7.652	0.045	678.754	
2008	31.959	4.511	6.674	47.966	346.850	270.340	6.119	0.049	714.469	
2009	32.733	4.356	6.716	49.632	356.621	279.052	6.722	0.005	735.836	
2010	33.861	4.216	6.696	50.454	365.108	305.969	9.996	0.044	776.343	
2011	34.758	3.360	6.834	54.214	379.877	325.341	11.105	0.051	815.540	
2012	35.664	3.892	6.876	58.546	396.877	330.640	12.931	0.505	0.126	846.057
2013	36.438	3.797	6.914	50.862	405.233	340.033	14.722	1.487	0.513	859.998
2014	37.420	3.730	6.948	56.615	415.479	369.601	13.433	1.293	0.195	904.716
2015	38.253	3.454	7.008	55.004	425.316	384.125	18.188	1.235	0.145	932.727
2016	38.912	3.244	6.697	58.604	432.193	407.512	21.515	2.280	0.146	971.104
2017	39.775	3.273	6.809	59.568	432.021	432.463	22.896	2.441	0.156	999.402
2018	40.364	3.327	6.920	61.143	420.921	451.876	26.475	2.405	0.207	1,013.636
2019	40.909	3.379	6.894	62.993	430.948	456.668	35.108	2.232	0.219	1,039.349
2020	41.514	3.430	6.999	58.762	407.172	473.226	36.433	2.196	0.220	1,029.950

Africa Consumption

Figure A.13 Total and per capita energy consumption per source in Africa 1820-2020 (Mtoe and koe)

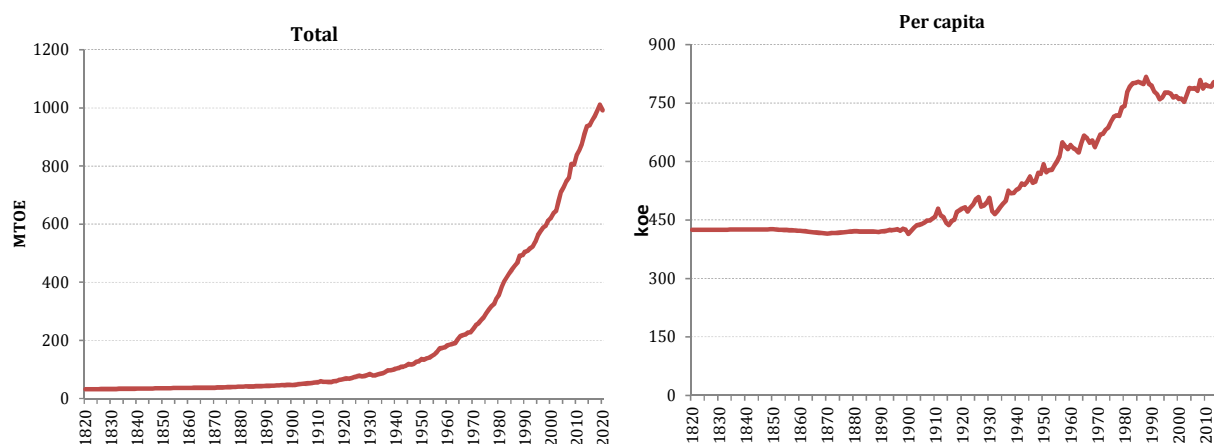


Table A.12 Total energy consumption per source in Africa 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9	
	Food	Fuelwood	Fodder	Coal	Oil	Gas	Electricity	Nuclear	Biofuels	Total
1820	5.833	19.378	6.212							31.423
1821	5.858	19.453	6.236							31.547
1822	5.884	19.527	6.260							31.672
1823	5.910	19.602	6.284							31.796
1824	5.937	19.677	6.308							31.922
1825	5.963	19.753	6.332							32.048
1826	5.989	19.828	6.357							32.174
1827	6.016	19.904	6.381							32.301
1828	6.042	19.981	6.405							32.428
1829	6.069	20.057	6.430							32.556
1830	6.096	20.134	6.455							32.684
1831	6.123	20.211	6.479							32.813
1832	6.150	20.289	6.504							32.943
1833	6.177	20.367	6.529							33.073
1834	6.204	20.445	6.554							33.203
1835	6.232	20.523	6.579							33.334
1836	6.259	20.602	6.604							33.465
1837	6.287	20.681	6.630							33.597
1838	6.315	20.760	6.655							33.730
1839	6.343	20.839	6.681							33.863
1840	6.371	20.919	6.706							33.996
1841	6.399	20.999	6.732							34.130
1842	6.427	21.080	6.758							34.265
1843	6.456	21.161	6.784							34.400
1844	6.484	21.242	6.810							34.536
1845	6.513	21.323	6.836							34.672
1846	6.542	21.405	6.862							34.809
1847	6.571	21.487	6.888							34.946
1848	6.600	21.569	6.915							35.084
1849	6.629	21.652	6.941							35.222

1850	6.658	21.735	6.968		35.361	
1851	6.689	21.787	6.996		35.473	
1852	6.720	21.840	7.024		35.584	
1853	6.751	21.892	7.053		35.697	
1854	6.783	21.945	7.082		35.809	
1855	6.814	21.997	7.110		35.922	
1856	6.846	22.050	7.139		36.035	
1857	6.878	22.103	7.168		36.149	
1858	6.910	22.156	7.197		36.263	
1859	6.942	22.209	7.226		36.378	
1860	6.974	22.263	7.256		36.493	
1861	7.007	22.285	7.285		36.576	
1862	7.039	22.306	7.315		36.660	
1863	7.072	22.328	7.344		36.744	
1864	7.105	22.350	7.374		36.828	
1865	7.138	22.371	7.404		36.913	
1866	7.171	22.393	7.434		36.998	
1867	7.204	22.415	7.464		37.083	
1868	7.238	22.437	7.495		37.169	
1869	7.271	22.458	7.525		37.255	
1870	7.306	22.481	7.556		37.343	
1871	7.361	22.679	7.606		37.646	
1872	7.416	22.879	7.657		37.952	
1873	7.472	23.081	7.709		38.261	
1874	7.528	23.284	7.760		38.572	
1875	7.585	23.489	7.812		38.886	
1876	7.642	23.696	7.865		39.202	
1877	7.699	23.904	7.918		39.521	
1878	7.757	24.115	7.971		39.843	
1879	7.815	24.327	8.024		40.167	
1880	7.874	24.542	8.078		40.494	
1881	7.933	24.690	8.132		40.755	
1882	7.993	24.838	8.187		41.018	
1883	8.053	24.987	8.242		41.282	
1884	8.114	25.137	8.297		41.548	
1885	8.175	25.289	8.353		41.816	
1886	8.236	25.440	8.409		42.086	
1887	8.298	25.593	8.465		42.357	
1888	8.361	25.747	8.523		42.631	
1889	8.424	25.902	8.481	0.011	42.818	
1890	8.487	26.058	8.687	0.035	43.267	
1891	8.551	26.228	8.771	0.039	43.588	
1892	8.615	26.399	8.936	0.062	44.012	
1893	8.680	26.571	8.660	0.594	44.505	
1894	8.745	26.745	8.470	0.801	44.761	
1895	8.811	26.920	8.389	1.096	45.215	
1896	8.877	27.095	8.294	1.398	45.664	
1897	8.944	27.272	7.745	1.563	45.525	
1898	9.011	27.450	7.940	1.974	46.376	
1899	9.079	27.630	7.924	1.797	46.430	
1900	9.147	27.810	7.908	0.756	45.622	
1901	9.245	28.100	8.208	1.273	46.826	
1902	9.344	28.393	8.532	1.892	48.161	
1903	9.444	28.689	8.719	2.565	49.416	
1904	9.545	28.987	8.628	2.877	50.037	
1905	9.647	29.289	8.567	3.296	50.800	
1906	9.750	29.595	8.645	3.711	51.702	
1907	9.855	29.903	8.968	4.126	52.852	
1908	9.960	30.214	8.980	4.277	53.432	
1909	10.067	30.529	9.087	4.905	54.588	
1910	10.174	30.847	9.030	5.547	0.073	55.671
1911	10.283	31.140	11.249	5.920	0.094	58.686

1912	10.393	31.435	8.892	6.298	0.176			57.193
1913	10.506	31.733	7.937	6.812	0.140			57.127
1914	10.677	32.240	6.266	6.665	0.381			56.229
1915	10.851	32.755	5.988	6.584	0.187			56.365
1916	11.028	33.278	6.002	8.006	0.383			58.697
1917	11.208	33.809	5.979	8.529	0.630			60.155
1918	11.391	34.349	8.714	8.387	1.002			63.843
1919	11.577	34.898	9.507	8.688	0.827			65.497
1920	11.766	35.455	9.165	10.172	0.628			67.186
1921	11.958	36.013	9.775	10.162	0.701			68.608
1922	12.153	36.580	10.012	8.824	0.714			68.284
1923	12.351	37.156	10.020	10.679	0.680			70.887
1924	12.553	37.741	10.246	11.724	0.861			73.125
1925	12.757	38.336	10.260	13.938	1.045	0.004		76.341
1926	12.966	38.939	10.458	14.899	1.293	0.004		78.559
1927	13.177	39.552	6.828	14.875	1.521	0.004		75.956
1928	13.392	40.175	6.905	15.304	1.864	0.004		77.643
1929	13.611	40.807	7.244	16.232	2.314	0.008		80.216
1930	13.833	41.450	10.769	15.100	2.363	0.009		83.523
1931	14.058	42.112	7.119	13.369	2.394	0.010		79.062
1932	14.288	42.785	7.338	12.269	2.467	0.012		79.160
1933	14.521	43.469	7.290	13.928	2.653	0.019		81.880
1934	14.758	44.163	7.399	15.658	2.850	0.031		84.859
1935	14.999	44.869	7.592	17.180	3.099	0.030		87.768
1936	15.243	45.586	7.706	18.610	3.433	0.031		90.609
1937	15.492	46.314	11.252	19.900	3.883	0.043		96.883
1938	15.745	47.054	8.801	21.396	4.229	0.045		97.270
1939	16.002	47.806	8.373	21.821	4.919	0.052		98.972
1940	16.263	48.569	8.356	22.412	6.441	0.061		102.103
1941	16.529	49.326	8.514	23.643	6.547	0.066		104.624
1942	16.799	50.095	8.675	25.531	7.657	0.068		108.824
1943	17.073	50.876	8.967	25.891	7.022	0.053		109.883
1944	17.351	51.669	8.791	28.486	6.988	0.066		113.350
1945	17.643	52.500	11.282	28.758	7.732	0.084		117.999
1946	17.940	53.344	7.848	28.879	8.563	0.120	0.019	116.713
1947	18.396	54.202	8.009	29.009	9.494	0.120	0.020	119.251
1948	18.707	55.074	12.292	29.465	10.535	0.124	0.017	126.214
1949	19.022	55.960	9.897	31.185	11.703	0.126	0.024	127.917
1950	19.343	56.860	12.957	32.900	13.252	0.131	0.153	135.597
1951	19.822	57.780	8.519	33.179	13.926	0.140	0.171	133.537
1952	20.263	58.750	8.546	34.978	14.681	0.142	0.186	137.546
1953	20.723	59.766	8.570	35.681	15.541	0.154	0.246	140.680
1954	21.223	60.830	9.830	36.778	17.229	0.170	0.284	146.344
1955	21.718	61.941	8.697	40.509	18.909	0.174	0.320	152.269
1956	22.246	63.099	12.356	42.475	18.757	0.191	0.371	159.495
1957	22.787	64.304	18.077	48.035	18.610	0.192	0.492	172.496
1958	23.320	65.555	13.868	50.353	20.138	0.205	0.536	173.974
1959	23.941	66.853	12.883	49.498	21.831	0.237	0.641	175.884
1960	24.562	67.157	14.949	51.670	23.710	0.253	0.862	183.164
1961	25.291	67.483	14.637	51.820	24.492	0.409	1.167	185.300
1962	25.891	67.829	14.051	52.722	26.049	0.657	1.390	188.589
1963	26.767	68.193	12.247	54.234	27.295	0.885	1.479	191.101
1964	27.543	68.575	13.189	58.231	32.915	1.644	1.666	203.763
1965	28.463	68.973	14.877	63.264	36.032	1.353	1.784	214.746
1966	29.040	69.387	14.884	62.239	39.281	1.535	2.098	218.465
1967	29.734	69.818	14.913	63.236	38.586	1.494	2.071	219.853
1968	30.633	70.262	15.407	65.928	41.279	1.563	2.421	227.493
1969	31.563	70.717	13.072	66.719	40.993	1.805	2.749	227.618
1970	32.575	71.181	15.990	68.988	46.219	1.827	3.061	239.841
1971	33.530	71.654	16.354	73.194	49.768	3.695	3.345	251.540
1972	34.362	72.136	16.365	73.593	54.612	4.285	3.519	258.871
1973	35.495	72.635	16.527	78.562	57.902	4.998	3.692	269.811

1974	36.644	73.160	16.826	82.020	61.001	5.829	3.961			279.440
1975	37.819	73.717	17.001	87.505	65.832	7.271	4.263			293.407
1976	38.963	74.304	16.617	91.989	71.703	8.573	4.750			306.900
1977	40.292	74.919	16.631	94.598	76.193	9.360	4.824			316.817
1978	41.676	75.559	16.822	92.116	80.708	13.382	5.121			325.384
1979	43.251	76.219	17.176	98.038	86.161	18.646	5.107			344.598
1980	44.949	76.896	16.626	91.023	94.184	26.912	5.516			356.106
1981	46.575	77.586	15.975	99.947	104.533	34.425	5.678			384.720
1982	48.279	78.288	16.736	107.256	110.968	35.574	5.543			402.645
1983	49.375	78.998	17.508	110.056	115.701	41.217	5.316			418.170
1984	50.773	79.710	17.182	112.740	121.870	41.322	5.404	2.053		431.055
1985	52.516	80.421	18.131	116.724	124.238	44.362	5.413	2.786		444.591
1986	54.007	81.128	18.645	119.511	122.957	49.064	5.783	4.622		455.717
1987	55.900	81.828	18.170	123.502	127.601	51.157	5.395	3.241		466.792
1988	57.600	82.516	18.108	132.525	133.984	54.951	5.780	5.514		490.978
1989	58.969	83.187	18.631	124.404	139.316	57.119	5.885	5.829		493.341
1990	60.916	85.468	19.328	127.455	142.778	58.068	5.875	4.425		504.312
1991	61.825	87.201	19.611	125.320	144.240	58.716	6.238	4.776		507.927
1992	63.840	89.771	19.772	125.490	144.933	62.269	6.070	4.846		516.992
1993	65.937	92.585	19.007	126.391	145.731	62.859	5.653	3.789		521.951
1994	67.818	98.429	18.198	130.447	147.535	65.740	5.887	5.080		539.134
1995	70.342	101.134	18.358	134.772	155.860	69.176	6.026	5.932		561.601
1996	72.499	102.408	18.407	137.429	160.127	72.260	6.404	6.193		575.729
1997	74.817	103.237	18.818	140.088	164.699	73.074	6.640	6.664		588.036
1998	77.295	105.050	19.240	137.312	166.594	75.645	6.792	7.186		595.114
1999	79.364	107.218	19.535	143.695	169.226	79.289	7.065	6.799		612.191
2000	81.070	107.890	19.756	144.103	170.185	84.281	7.444	6.917		621.644
2001	83.819	110.806	20.581	145.963	169.711	92.992	7.782	5.716		637.370
2002	86.082	112.477	21.869	140.064	174.881	96.312	8.368	6.412		646.465
2003	88.313	116.212	21.843	153.652	179.144	105.965	8.367	6.448		679.943
2004	90.853	118.814	21.958	168.037	182.213	113.850	8.808	6.824		711.356
2005	93.995	121.709	22.299	157.097	195.996	121.223	8.977	5.791		727.087
2006	97.202	124.533	22.017	160.537	196.564	130.631	9.387	6.060		746.932
2007	99.783	123.488	23.113	163.532	201.018	132.877	10.071	5.840		759.720
2008	102.876	126.334	23.587	181.217	212.125	144.391	9.596	6.731	0.006	806.862
2009	105.291	130.139	24.007	180.428	215.400	133.768	9.816	6.647	0.005	805.503
2010	109.094	133.187	24.278	179.221	233.136	140.241	11.111	6.297	0.006	836.572
2011	112.827	136.914	24.344	175.713	219.272	166.068	12.283	7.044	0.009	854.474
2012	114.516	134.446	24.448	172.796	232.361	178.162	12.314	6.256	0.007	875.306
2013	117.946	138.822	24.523	172.966	251.833	184.638	13.112	7.398	0.010	911.247
2014	120.626	140.962	24.601	177.445	261.331	189.391	15.209	7.249	0.012	936.828
2015	123.119	142.362	24.772	169.522	266.089	190.679	17.928	6.216	0.015	940.701
2016	125.640	132.614	24.856	181.658	267.343	197.341	19.990	7.599	0.017	957.058
2017	128.312	136.186	25.483	179.811	264.229	207.423	22.294	7.147	0.017	970.901
2018	131.374	139.617	26.118	175.306	264.681	223.056	24.546	5.807	0.017	990.521
2019	132.240	143.099	26.608	182.833	267.287	224.376	28.016	6.804	0.017	1,011.280
2020	135.364	146.631	27.264	173.933	246.785	222.568	30.994	7.771	0.017	991.327

Consumption Per country

Table A.13 Energy consumption per country 1820-2020 (Mtoe)

	1	2	3	4	5	6	7	8	9
	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy
	WE	WE	WE	WE	WE	WE	WE	WE	WE
1820	1.262	2.334	0.640	1.134	12.485	9.834	0.859	3.078	8.342
1830	1.285	2.617	0.691	1.217	13.310	10.811	0.901	3.521	9.269
1840	1.400	3.692	0.781	1.220	15.650	13.034	0.999	4.174	10.135
1850	1.504	4.253	0.890	1.287	18.144	14.939	1.059	3.780	10.396
1860	1.856	6.021	1.068	1.361	22.875	21.850	1.131	3.867	11.172
1870	2.438	8.793	1.317	1.371	25.921	32.365	1.213	4.019	10.793
1880	3.200	10.439	1.427	1.540	32.108	46.248	1.258	4.057	12.230
1890	4.243	13.188	1.727	1.731	38.355	67.113	1.350	4.064	14.377
1900	5.585	16.023	2.076	2.030	46.137	99.376	1.448	4.168	14.879
1910	6.941	20.368	2.819	2.466	51.899	132.866	1.555	4.357	18.862
1920	7.123	17.630	2.955	2.434	52.386	124.267	1.743	4.569	17.107
1930	7.090	27.499	4.954	3.001	77.943	156.505	2.289	3.834	23.818
1940	6.236	21.964	4.179	4.234	49.736	180.318	2.185	3.728	27.280
1950	8.284	23.531	8.289	4.435	67.546	145.318	2.993	3.613	28.412
1960	12.590	28.907	12.687	7.676	92.050	205.702	6.037	4.350	53.427
1970	20.087	47.861	21.608	16.333	163.211	299.332	11.295	6.706	127.437
1980	24.687	50.532	20.677	23.815	202.679	367.843	18.608	8.843	156.472
1990	25.874	56.816	18.171	31.114	244.239	368.217	24.884	10.261	155.073
2000	29.442	68.325	22.073	35.647	284.189	353.919	32.063	15.007	172.247
2010	34.303	72.005	23.415	37.614	286.477	355.691	33.208	16.394	184.692
2020	32.070	59.216	17.965	33.525	244.429	334.485	26.987	16.775	154.311

	10	11	12	13	14	15	16	17	18
	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	UK	Bulgaria	Czecho-slovakia
	WE	WE	WE	WE	WE	WE	WE	EE	EE
1820	1.015	0.941	1.423	5.668	2.676	0.738	21.368	0.939	3.289
1830	1.198	1.005	1.516	6.063	2.747	0.747	25.414	0.982	3.601
1840	1.507	1.063	1.619	6.500	2.821	0.799	33.349	1.027	3.961
1850	1.627	1.137	1.742	7.031	2.941	0.827	45.917	1.073	4.337
1860	2.038	1.329	1.948	6.993	3.321	0.931	61.249	1.066	4.983
1870	2.856	1.499	2.170	7.152	3.656	1.082	77.413	1.090	6.529
1880	3.636	1.749	2.365	7.284	4.255	1.289	96.853	1.244	8.416
1890	4.146	1.965	2.811	7.936	4.779	1.568	114.814	1.408	10.399
1900	5.322	2.679	3.018	9.254	6.211	2.400	136.011	1.638	11.808
1910	6.798	3.351	3.546	10.744	7.683	3.030	152.480	1.873	13.403
1920	7.428	3.418	3.448	11.173	7.473	2.910	155.301	2.020	18.235
1930	12.211	4.147	4.200	13.898	9.411	3.892	149.168	2.690	20.420
1940	10.851	5.405	4.722	15.644	11.582	3.853	163.803	3.280	14.635
1950	14.977	6.431	5.607	17.842	13.904	5.018	169.683	4.330	25.353
1960	21.205	9.440	6.582	25.342	20.489	9.095	192.941	8.075	43.234
1970	43.465	16.648	9.181	45.562	34.805	18.030	232.119	19.670	62.571
1980	65.585	21.415	13.062	73.474	40.882	22.386	234.746	30.501	86.300
1990	66.250	27.207	18.621	91.964	50.088	25.563	224.126	29.905	81.032
2000	72.607	32.734	26.697	124.825	49.610	27.241	240.094	20.370	68.167
2010	78.997	32.206	28.550	140.641	54.297	27.395	230.672	19.601	65.848
2020	73.965	35.734	26.414	129.797	60.769	24.585	194.698	18.923	57.487

	19	20	21	22	23	24	25	26	27
	Hungary	Poland	Romania	Yugoslavia	F. USSR	Canada	USA	Argentina	Bolivia
	EE	EE	EE	EE	EE	NA	NA	LA	LA
1820	1.781	4.722	2.744	2.240	23.524	1.791	25.563	0.201	0.409
1830	1.916	5.143	2.958	2.347	25.985	3.153	34.893	0.256	0.440
1840	2.060	5.827	3.187	2.459	28.686	4.060	47.883	0.328	0.478
1850	2.215	6.623	3.434	2.575	31.691	6.664	66.432	0.428	0.527
1860	2.526	8.659	3.592	2.949	34.111	9.052	92.007	0.585	0.576
1870	3.055	12.538	3.870	3.479	38.492	10.557	111.767	0.672	0.514
1880	3.518	16.765	4.066	3.726	45.449	12.205	144.807	0.852	0.494
1890	4.186	22.893	4.357	3.924	53.208	14.020	201.618	1.505	0.500
1900	5.573	30.371	4.711	4.662	73.381	15.047	268.749	2.182	0.546
1910	6.485	40.840	5.414	5.087	85.459	24.004	448.455	4.808	0.730
1920	5.029	32.819	5.796	5.133	63.261	32.937	570.363	5.673	0.833
1930	6.460	28.057	8.682	6.547	104.441	38.191	624.795	9.643	0.993
1940	7.604	64.285	13.615	7.025	202.198	41.201	660.297	10.357	1.083
1950	9.400	41.902	12.515	9.264	251.411	59.401	894.505	13.759	1.200
1960	15.914	60.010	24.645	13.387	525.884	77.505	1,157.974	24.732	1.542
1970	20.621	92.136	43.574	22.821	789.576	125.054	1,735.557	35.634	1.749
1980	29.596	135.744	69.393	37.970	1,175.005	194.696	1,992.453	44.725	2.575
1990	30.427	111.298	65.926	49.011	1,408.699	226.776	2,161.777	47.783	3.235
2000	26.203	94.080	38.019	39.802	915.731	257.554	2,526.913	63.449	4.951
2010	26.748	106.683	35.714	45.335	989.615	281.394	2,534.661	79.817	7.388
2020	26.316	105.540	35.403	44.524	989.643	294.497	2,659.037	82.501	9.315

	28	29	30	31	32	33	34	35	36
	Brazil	Chile	Colombia	Costa Rica	Cuba	Dominican Rep.	Ecuador	El Salvador	Guatemala
	LA	LA	LA	LA	LA	LA	LA	LA	LA
1820	1.693	0.290	0.448	0.023	0.227	0.033	0.186	0.092	0.219
1830	1.984	0.363	0.536	0.027	0.285	0.039	0.219	0.105	0.246
1840	2.346	0.448	0.647	0.032	0.360	0.046	0.260	0.120	0.280
1850	2.814	0.549	0.792	0.039	0.504	0.056	0.313	0.140	0.323
1860	3.552	0.792	0.896	0.047	0.594	0.076	0.366	0.171	0.382
1870	3.617	0.859	0.837	0.047	0.636	0.087	0.348	0.169	0.367
1880	4.186	1.214	0.929	0.061	0.631	0.107	0.356	0.194	0.330
1890	5.397	1.430	1.129	0.090	0.729	0.149	0.397	0.243	0.324
1900	7.165	1.861	1.436	0.137	0.862	0.221	0.471	0.324	0.339
1910	11.180	2.805	2.118	0.208	1.669	0.334	0.639	0.486	0.517
1920	13.662	2.440	2.717	0.222	2.375	0.400	0.694	0.579	0.589
1930	17.689	3.873	3.519	0.281	2.478	0.569	0.941	0.749	0.864
1940	20.749	4.393	5.095	0.335	2.914	0.807	1.226	0.813	1.154
1950	27.924	5.728	6.160	0.477	4.962	1.000	1.679	0.925	1.453
1960	43.370	7.595	10.012	0.686	6.772	1.524	2.280	1.159	1.709
1970	59.126	10.353	15.008	0.927	8.874	2.064	2.785	1.395	2.079
1980	109.441	10.462	19.906	1.327	13.044	3.221	4.841	1.946	2.980
1990	155.886	14.616	23.544	1.894	14.784	4.644	7.841	2.063	3.230
2000	210.290	25.873	28.880	3.551	11.660	8.721	9.533	3.380	5.475
2010	299.548	31.451	36.654	4.521	13.875	9.057	14.105	4.058	7.048
2020	358.042	41.125	46.759	5.279	10.687	12.164	14.906	4.377	9.998

	37	38	39	40	41	42	43	44	45
	Haiti	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
	LA	LA	LA	LA	LA	LA	LA	LA	LA
1820	0.263	0.050	2.495	0.068	0.000	0.053	0.494	0.021	0.267
1830	0.287	0.068	2.624	0.080	0.002	0.072	0.568	0.028	0.327
1840	0.316	0.095	2.783	0.095	0.010	0.097	0.659	0.037	0.405
1850	0.353	0.133	2.996	0.114	0.052	0.134	0.775	0.051	0.508
1860	0.410	0.150	3.443	0.127	0.062	0.147	0.942	0.105	0.595
1870	0.387	0.137	3.238	0.115	0.060	0.132	0.972	0.207	0.568
1880	0.361	0.130	3.513	0.122	0.065	0.134	0.898	0.255	0.603
1890	0.371	0.135	4.230	0.146	0.077	0.150	0.962	0.423	0.724
1900	0.400	0.149	6.075	0.176	0.096	0.177	1.078	0.685	0.871
1910	0.658	0.238	9.032	0.273	0.151	0.271	1.950	1.219	1.116
1920	0.824	0.320	9.121	0.324	0.203	0.312	2.448	1.026	1.247
1930	0.958	0.417	10.382	0.348	0.217	0.391	2.998	1.369	1.771
1940	1.080	0.580	14.972	0.447	0.290	0.484	3.569	1.493	3.040
1950	1.229	0.702	21.728	0.552	0.495	0.579	4.642	1.752	7.698
1960	1.347	0.896	32.335	0.757	0.883	0.749	5.850	2.229	16.988
1970	1.334	1.086	47.277	0.980	1.906	0.939	7.773	2.769	21.379
1980	1.485	1.441	92.034	1.409	4.444	1.289	11.502	2.809	39.840
1990	1.414	1.994	121.356	1.561	4.549	1.833	11.351	2.614	49.174
2000	1.855	2.826	151.461	2.224	5.613	2.563	14.372	3.526	64.034
2010	2.277	3.985	187.655	2.871	7.786	3.514	21.541	4.558	74.537
2020	2.567	4.825	176.878	3.765	8.847	5.080	24.448	5.128	34.252

	46	47	48	49	50	51	52	53	54
	Australia	N. Zealand	China	India	Indonesia	Japan	Malaysia	Philippines	Thailand
	O	O	As	As	As	As	As	As	As
1820	0.235	0.070	112.006	60.374	5.179	8.955	0.083	0.629	1.348
1830	0.255	0.072	120.212	62.837	5.624	9.048	0.102	0.744	1.400
1840	0.370	0.055	121.067	65.402	6.108	9.142	0.125	0.881	1.454
1850	0.646	0.094	121.041	68.070	6.633	9.238	0.153	1.043	1.510
1860	1.787	0.169	110.496	70.583	7.424	9.560	0.188	1.232	1.583
1870	2.747	0.418	104.503	72.971	8.295	9.881	0.229	1.452	1.656
1880	4.360	1.083	108.012	74.905	9.482	11.251	0.325	1.651	1.790
1890	6.490	1.594	112.093	82.390	10.897	13.458	0.462	1.877	1.933
1900	8.720	2.132	120.906	88.178	13.155	18.490	0.681	2.176	2.175
1910	11.504	3.267	131.910	99.014	15.699	26.641	0.947	2.887	2.516
1920	12.237	2.642	161.402	106.339	18.096	39.181	1.361	3.754	3.053
1930	11.437	3.133	170.201	118.361	21.123	48.467	2.117	5.219	3.982
1940	14.681	3.535	188.133	133.241	24.957	67.670	2.323	5.936	4.871
1950	20.758	4.013	198.514	137.663	27.012	58.189	3.095	7.991	6.418
1960	31.776	5.560	312.220	179.254	33.882	111.239	4.445	12.113	9.820
1970	51.290	8.007	435.893	225.260	38.236	303.297	6.660	19.024	16.219
1980	73.515	9.661	673.230	283.153	57.378	383.211	14.673	25.892	24.441
1990	89.105	14.213	962.324	409.945	85.385	470.626	26.350	31.616	43.730
2000	109.618	17.557	1,299.704	565.180	135.499	562.137	56.464	44.367	76.546
2010	129.083	18.742	2,731.649	766.875	192.105	536.192	84.404	49.885	117.458
2020	140.113	19.589	3,752.094	1,007.680	254.664	434.156	101.994	68.020	139.657

	55	56	57	58	59	60	61	62	63
	Iran	Iraq	Israel	S. Arabia	Syria	Turkey	Algeria	Congo R.D.	Egypt
	ME	ME	ME	ME	ME	ME	Af	Af	Af
1820	1.886	0.314		0.601	0.384	2.896	1.142	2.123	1.781
1830	1.982	0.338		0.633	0.398	2.989	1.223	2.219	1.978
1840	2.084	0.364		0.666	0.411	3.085	1.311	2.319	2.197
1850	2.191	0.392		0.701	0.425	3.184	1.404	2.423	2.440
1860	2.303	0.422		0.738	0.440	3.287	1.490	2.582	2.683
1870	2.421	0.455		0.673	0.455	3.433	1.567	2.728	2.925
1880	2.576	0.511		0.754	0.480	3.623	1.734	2.974	3.366
1890	2.739	0.574		0.844	0.506	3.885	1.890	3.193	3.815
1900	2.924	0.647		0.949	0.536	4.193	2.001	3.305	4.202
1910	3.134	0.733		1.071	0.570	4.727	2.208	3.625	4.822
1920	3.980	0.860		0.831	0.642	4.444	2.661	3.846	5.699
1930	4.505	1.171		0.933	0.758	5.216	3.527	4.423	7.799
1940	6.509	3.891		1.827	0.965	7.438	3.711	4.453	8.786
1950	5.364	2.082	1.140	7.581	1.353	9.670	4.595	5.221	12.588
1960	14.086	4.983	2.648	12.743	2.513	13.642	6.772	6.580	15.850
1970	20.657	6.010	5.648	22.897	3.276	21.184	7.540	7.616	17.952
1980	41.509	11.148	8.812	37.788	6.725	33.877	20.393	9.013	29.209
1990	76.950	21.804	12.123	81.338	13.894	55.515	33.487	10.481	47.635
2000	127.953	27.607	20.864	116.137	18.677	80.016	33.467	12.968	65.580
2010	214.970	37.609	24.628	207.875	25.761	112.738	46.642	17.689	98.296
2020	293.301	53.472	26.728	252.124	11.766	160.226	65.120	22.023	110.953

	64	65	66	67	68	69	70	71	72	
	Eritrea & Ethiopia	Libya	Malawi	Morocco	Nigeria	South Africa	Tunisia	Zambia	Zimbabwe	TOTAL
	Af	Af	Af	Af	Af	Af	Af	Af	Af	
1820	1.339	0.228	0.348	1.142	6.945	0.658	0.372	0.340	0.316	359.619
1830	1.555	0.239	0.389	1.223	7.049	0.728	0.395	0.349	0.321	396.148
1840	1.804	0.250	0.435	1.311	7.563	0.805	0.419	0.358	0.332	438.051
1850	2.094	0.262	0.486	1.404	7.361	0.890	0.445	0.367	0.333	489.352
1860	2.406	0.272	0.490	1.490	7.441	0.974	0.468	0.390	0.341	553.214
1870	2.742	0.279	0.491	1.567	7.459	1.057	0.488	0.411	0.373	621.079
1880	3.224	0.296	0.507	1.705	7.717	1.316	0.551	0.446	0.398	730.605
1890	3.732	0.309	0.617	1.827	7.860	1.635	0.613	0.486	0.427	885.437
1900	4.200	0.314	0.730	1.902	7.782	2.394	0.663	0.515	0.434	1,092.112
1910	4.924	0.332	0.899	2.064	8.224	5.819	0.747	0.569	0.683	1,440.723
1920	5.574	0.339	0.936	2.307	9.546	8.690	0.879	0.648	0.979	1,603.891
1930	6.435	0.369	0.997	2.941	11.281	10.364	1.262	0.862	1.337	1,852.814
1940	7.027	0.387	1.006	3.346	12.442	16.916	1.404	1.142	1.630	2,132.969
1950	8.397	0.420	1.130	4.364	15.303	23.759	1.715	1.508	2.446	2,510.899
1960	9.625	0.520	1.380	5.730	17.857	36.130	2.051	2.229	4.456	3,658.670
1970	10.289	4.411	1.588	7.195	20.979	53.015	2.804	2.748	4.659	5,575.051
1980	11.622	8.577	1.921	10.299	30.806	70.157	5.184	3.675	4.723	7,358.678
1990	14.111	13.499	2.467	13.456	40.774	96.876	7.351	3.588	6.898	8,764.224
2000	18.739	16.260	3.099	17.721	50.028	113.834	10.313	3.739	7.035	9,808.905
2010	25.561	24.340	4.078	24.941	59.465	138.373	10.496	4.882	5.944	12,269.082
2020	33.570	17.120	4.915	30.754	89.207	132.241	13.759	7.474	6.178	13,806.937

GHG Emissions

World GHG emissions

Figure B.1 World total and per capita GHG emissions 1820-2020 (Mtons and Tons)

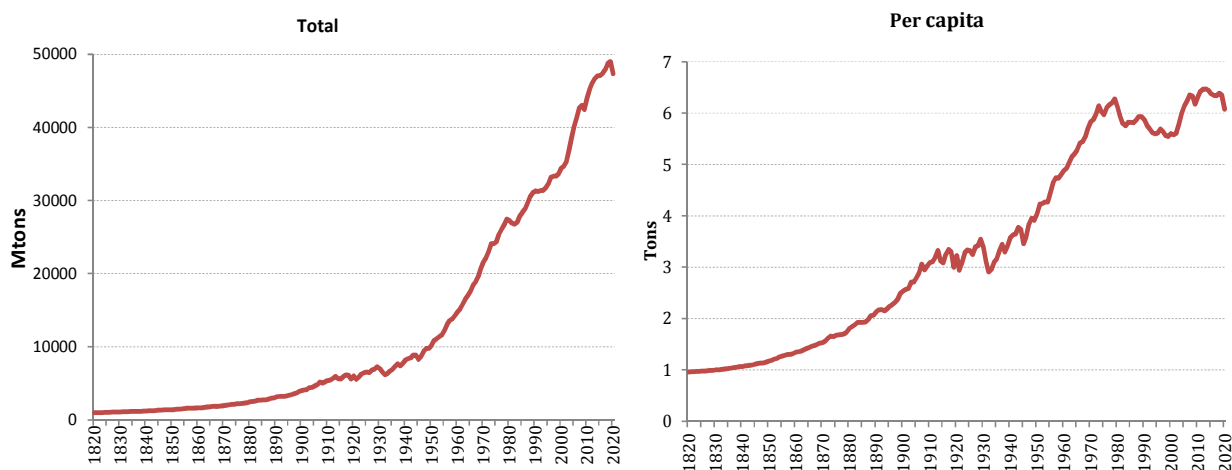


Figure B.2 Total GHG emissions per macroarea 1820-2020 (CO₂ Mtons)(log vertical axis)

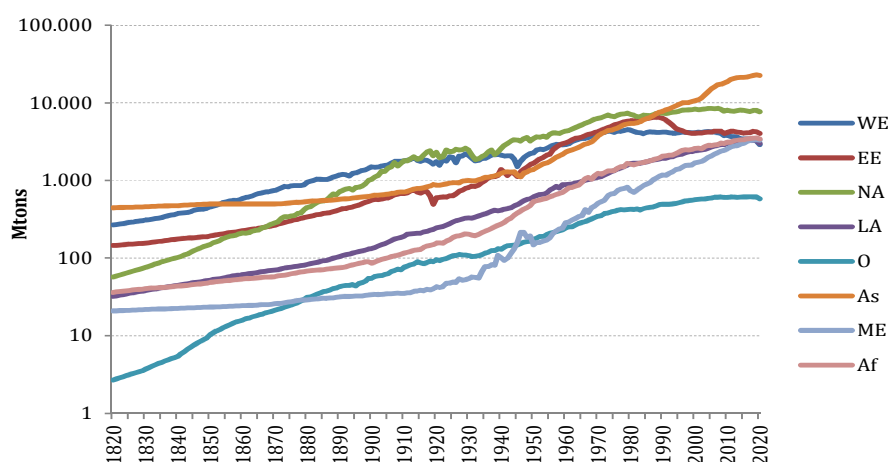


Table B.1 World GHG emissions per macroarea 1820-2020 (CO₂ Mtons)

	1	2	3	4	5	6	7	8	9
	WE	EE	NA	LA	O	As	ME	Af	WORLD
1820	267.726	144.680	57.259	32.041	2.683	445.831	20.884	36.183	1,007.287
1821	270.773	145.763	58.830	32.645	2.776	447.135	20.960	36.615	1,015.498
1822	273.863	147.035	60.441	33.262	2.875	448.405	21.036	37.061	1,023.978
1823	278.188	148.387	62.276	33.857	2.969	449.408	21.139	37.454	1,033.679
1824	282.778	149.409	64.009	34.501	3.065	450.648	21.215	37.881	1,043.507
1825	286.528	150.624	65.965	35.131	3.157	451.889	21.289	38.283	1,052.864
1826	289.904	151.413	67.764	35.762	3.255	453.116	21.394	38.721	1,061.328
1827	296.120	152.713	69.860	36.346	3.350	454.563	21.467	39.096	1,073.514
1828	299.907	153.471	71.593	36.985	3.444	455.540	21.546	39.473	1,081.959
1829	303.029	154.226	73.543	37.591	3.540	456.734	21.622	39.902	1,090.185
1830	309.773	155.729	75.640	38.245	3.698	457.918	21.724	40.323	1,103.050
1831	312.520	157.334	78.162	38.869	3.868	459.543	21.796	40.657	1,112.749
1832	317.578	159.424	81.048	39.498	4.036	461.279	21.869	40.941	1,125.671
1833	322.329	161.338	83.894	40.065	4.207	463.200	21.941	41.226	1,138.200
1834	327.665	163.314	85.928	40.713	4.378	464.909	22.039	41.553	1,150.501
1835	333.626	165.229	89.579	41.322	4.546	466.569	22.114	41.833	1,164.817

1836	343.578	167.344	92.071	41.952	4.729	468.284	22.183	42.143	1,182.284
1837	350.512	169.325	95.009	42.603	4.891	470.494	22.259	42.461	1,197.553
1838	357.555	171.428	96.887	43.204	5.077	472.130	22.331	42.785	1,211.397
1839	364.244	173.535	99.740	43.815	5.238	473.881	22.432	43.041	1,225.926
1840	373.720	175.828	102.210	44.481	5.426	475.540	22.501	43.292	1,242.996
1841	379.257	177.300	105.625	45.222	5.864	477.727	22.575	43.768	1,257.337
1842	383.153	178.589	109.335	46.026	6.275	479.619	22.644	44.201	1,269.842
1843	388.712	179.905	113.493	46.665	6.711	481.784	22.747	44.675	1,284.691
1844	396.632	181.526	118.471	47.364	7.151	483.685	22.822	45.095	1,302.745
1845	411.956	183.284	124.287	48.141	7.594	485.873	22.893	45.571	1,329.597
1846	418.944	184.836	129.289	48.826	8.038	487.836	22.967	46.049	1,346.785
1847	427.447	186.120	135.479	49.584	8.462	490.001	23.065	46.468	1,366.627
1848	426.147	187.341	140.863	50.371	8.906	491.913	23.138	46.933	1,375.612
1849	436.777	188.149	145.781	51.108	9.356	494.112	23.206	47.354	1,395.843
1850	455.416	192.745	149.089	52.032	10.321	496.322	23.300	48.617	1,427.843
1851	465.318	195.650	157.179	52.929	10.860	496.320	23.430	49.065	1,450.751
1852	480.264	198.902	162.690	53.669	11.494	496.803	23.530	49.632	1,476.983
1853	495.254	201.978	169.596	54.509	12.045	497.022	23.659	50.153	1,504.216
1854	520.079	204.834	178.680	55.282	12.645	497.152	23.758	50.696	1,543.126
1855	531.093	208.584	185.082	56.166	13.267	497.224	23.853	51.148	1,566.417
1856	543.240	212.042	190.170	57.663	13.830	497.304	23.969	51.588	1,589.806
1857	552.826	215.219	194.345	58.797	14.443	497.229	24.051	52.132	1,609.042
1858	552.526	216.543	197.764	59.647	15.023	497.480	24.161	52.587	1,615.733
1859	560.798	220.871	204.743	60.163	15.450	497.352	24.228	53.002	1,636.607
1860	586.052	223.692	209.767	61.169	15.905	498.522	24.324	53.453	1,672.883
1861	601.662	227.001	208.067	61.975	16.603	498.157	24.396	53.900	1,691.762
1862	612.326	230.673	211.665	62.799	16.873	497.810	24.494	54.332	1,710.972
1863	633.467	234.578	222.276	63.391	17.516	497.722	24.555	54.753	1,748.259
1864	657.456	237.893	228.477	64.557	17.899	497.645	24.659	55.277	1,783.863
1865	678.638	242.312	230.500	65.488	18.561	497.544	24.891	55.641	1,813.574
1866	693.417	245.713	244.158	66.773	18.787	497.397	25.055	56.094	1,847.394
1867	706.494	251.132	248.771	67.607	19.639	496.996	25.167	56.515	1,872.321
1868	715.968	255.859	261.262	68.647	20.025	496.872	25.176	56.878	1,900.685
1869	733.795	259.921	275.214	69.177	20.555	496.774	25.374	57.345	1,938.156
1870	740.228	264.238	283.162	69.916	21.252	497.153	25.674	57.800	1,959.423
1871	765.313	273.827	291.258	71.028	21.909	499.889	25.956	58.953	2,008.132
1872	802.001	279.940	321.675	72.920	22.521	502.716	26.283	59.446	2,087.500
1873	836.514	287.347	340.791	74.376	23.430	506.162	26.624	60.440	2,155.684
1874	822.185	295.779	340.343	75.944	24.204	510.299	27.037	61.609	2,157.401
1875	851.536	301.505	348.743	76.607	24.816	515.064	27.515	62.736	2,208.523
1876	855.739	310.898	352.748	77.641	25.730	519.207	27.841	63.972	2,233.775
1877	855.681	313.479	374.862	78.608	26.641	522.687	28.434	65.070	2,265.462
1878	860.596	323.279	376.667	79.794	27.846	527.011	28.676	66.153	2,290.022
1879	875.263	331.720	416.911	81.041	29.165	531.137	28.720	67.130	2,361.087
1880	947.661	339.160	446.440	82.431	31.143	534.098	29.015	67.923	2,477.871
1881	980.280	344.804	460.440	84.399	31.483	537.483	29.282	68.653	2,536.825
1882	1,003.484	350.536	491.010	86.175	32.796	540.917	29.482	69.343	2,603.743
1883	1,039.769	361.941	518.482	88.106	34.346	543.869	29.724	70.022	2,686.260
1884	1,029.826	367.278	537.292	90.319	35.520	547.451	29.936	70.665	2,708.287
1885	1,027.630	374.922	544.566	92.185	36.903	550.542	30.185	71.260	2,728.193
1886	1,025.628	379.392	560.782	93.544	37.705	553.923	30.306	71.980	2,753.260
1887	1,056.026	385.235	612.318	96.090	38.775	558.144	30.654	72.528	2,849.769
1888	1,101.393	396.563	670.081	99.144	40.464	561.827	30.869	73.153	2,973.495
1889	1,137.486	406.710	653.285	102.177	40.993	566.440	31.282	73.869	3,012.241
1890	1,175.039	418.943	712.030	104.669	42.705	570.824	31.603	75.132	3,130.945
1891	1,198.334	432.032	743.754	107.657	43.858	576.396	31.807	75.928	3,209.767
1892	1,187.199	434.963	773.901	110.348	44.404	580.418	31.979	76.768	3,239.981
1893	1,141.717	449.267	783.650	112.001	44.520	585.480	32.131	79.690	3,228.457
1894	1,232.352	455.025	751.796	116.192	45.641	592.225	32.260	81.326	3,306.817
1895	1,253.489	471.664	813.621	118.480	43.963	598.408	32.405	83.333	3,415.364
1896	1,295.850	481.941	816.040	121.289	46.972	604.486	32.626	85.401	3,484.605
1897	1,342.847	499.283	843.542	123.505	48.247	609.657	32.650	86.792	3,586.523

1898	1,366.346	522.281	902.095	126.921	50.110	618.944	33.071	89.270	3,709.039
1899	1,441.746	537.620	1,002.569	130.444	54.909	623.315	33.386	89.371	3,913.359
1900	1,494.456	556.577	1,034.607	132.383	55.067	631.560	33.584	85.801	4,024.035
1901	1,472.365	569.113	1,109.880	137.764	57.872	641.252	34.042	89.000	4,111.288
1902	1,482.424	566.239	1,156.549	142.802	58.809	645.804	33.957	92.587	4,179.173
1903	1,535.986	573.709	1,316.351	148.430	59.444	651.564	34.129	96.365	4,415.979
1904	1,554.394	591.121	1,310.183	153.629	61.294	659.927	34.352	98.733	4,463.634
1905	1,581.777	592.741	1,434.783	160.543	62.711	664.760	34.575	101.430	4,633.321
1906	1,679.640	620.067	1,495.547	168.500	67.020	677.654	34.645	104.214	4,847.286
1907	1,762.060	652.392	1,700.391	175.925	69.359	687.868	35.092	106.990	5,190.076
1908	1,759.231	665.150	1,531.307	181.153	72.049	700.519	35.155	108.650	5,053.214
1909	1,774.531	679.300	1,661.655	184.432	70.269	705.743	34.905	112.349	5,223.184
1910	1,791.300	678.073	1,796.158	190.892	76.240	709.224	35.021	116.353	5,393.260
1911	1,834.457	692.124	1,783.171	202.933	79.105	725.902	35.404	119.017	5,472.114
1912	1,856.207	729.053	1,901.293	205.332	82.221	747.065	35.766	122.066	5,679.004
1913	1,983.700	753.014	2,016.559	207.047	84.267	770.810	37.362	125.483	5,978.243
1914	1,812.166	710.739	1,875.525	208.336	89.450	783.741	37.608	127.563	5,645.128
1915	1,752.175	684.777	1,924.866	209.277	86.852	783.039	38.565	128.911	5,608.463
1916	1,832.988	716.974	2,111.588	217.269	84.996	803.864	37.970	137.585	5,943.234
1917	1,817.695	719.817	2,301.565	221.225	87.388	823.786	39.408	142.770	6,153.655
1918	1,731.792	630.370	2,396.310	228.062	90.938	846.090	38.971	145.482	6,108.015
1919	1,622.832	492.619	2,072.463	233.857	89.876	883.523	40.056	148.353	5,583.578
1920	1,747.896	597.603	2,306.990	245.359	95.678	862.931	42.599	155.787	6,054.843
1921	1,570.701	604.033	1,966.771	249.284	92.757	863.367	41.871	157.981	5,546.766
1922	1,823.997	613.609	2,019.544	255.327	96.444	877.378	42.860	154.756	5,883.915
1923	1,768.917	605.514	2,461.938	265.590	98.753	901.805	47.618	164.994	6,315.129
1924	2,007.037	631.944	2,331.798	276.970	103.154	925.716	47.411	172.246	6,496.276
1925	1,975.353	631.209	2,368.323	290.478	106.640	937.977	49.141	183.889	6,543.011
1926	1,681.351	671.377	2,531.083	300.793	108.222	940.001	48.638	190.817	6,472.282
1927	2,063.543	725.448	2,459.456	310.424	111.673	933.480	54.100	193.637	6,851.760
1928	2,071.353	749.817	2,489.380	319.629	110.013	978.179	52.016	198.541	6,968.929
1929	2,205.095	792.587	2,615.059	327.249	109.235	995.318	52.693	205.626	7,302.861
1930	2,090.797	809.738	2,448.421	329.115	107.972	998.967	54.314	202.698	7,042.021
1931	1,915.988	846.727	2,106.427	326.980	104.415	991.071	56.975	197.039	6,545.621
1932	1,785.008	841.737	1,861.520	338.746	105.271	987.619	56.108	194.171	6,170.180
1933	1,812.144	875.062	1,912.030	349.563	107.382	1,023.132	55.419	202.682	6,337.414
1934	1,925.400	948.821	2,026.938	359.349	110.825	1,050.837	67.239	211.724	6,701.134
1935	1,919.481	1,003.924	2,110.361	372.728	115.481	1,089.196	77.678	220.070	6,908.920
1936	1,998.699	1,075.606	2,334.678	384.402	119.075	1,102.018	77.547	230.553	7,322.579
1937	2,139.432	1,110.454	2,453.664	400.619	124.221	1,123.035	82.254	241.155	7,674.834
1938	2,124.457	1,120.952	2,154.468	412.034	125.048	1,146.137	80.906	252.267	7,416.268
1939	2,162.357	1,159.769	2,332.174	405.022	131.648	1,181.888	108.270	262.501	7,743.629
1940	2,116.210	1,380.121	2,561.227	411.949	129.544	1,236.764	100.756	274.071	8,210.643
1941	2,063.511	1,278.719	2,828.476	427.540	138.838	1,276.704	93.311	288.031	8,395.130
1942	2,084.154	1,154.393	2,979.297	433.476	143.794	1,295.062	99.836	311.957	8,501.968
1943	2,072.874	1,273.324	3,214.041	445.805	144.970	1,283.668	114.917	328.003	8,877.603
1944	1,871.038	1,233.728	3,344.467	469.368	146.512	1,292.929	131.704	357.651	8,847.397
1945	1,511.333	1,120.587	3,304.922	487.391	147.436	1,162.561	160.129	380.963	8,275.322
1946	1,765.055	1,293.618	3,215.255	517.445	153.446	1,115.191	213.638	404.259	8,677.906
1947	1,964.321	1,390.487	3,456.097	547.329	159.434	1,240.140	213.106	426.547	9,397.460
1948	2,091.178	1,481.238	3,554.715	568.111	162.765	1,281.727	184.963	449.327	9,774.025
1949	2,211.288	1,592.970	3,215.490	579.927	164.661	1,358.038	192.172	474.378	9,788.924
1950	2,249.443	1,665.976	3,462.541	611.985	174.486	1,382.256	147.732	533.329	10,227.748
1951	2,457.726	1,777.337	3,654.215	637.561	180.619	1,476.988	158.591	546.373	10,889.410
1952	2,523.905	1,882.836	3,607.020	656.150	188.949	1,549.106	158.388	558.673	11,125.027
1953	2,491.010	1,989.356	3,700.482	666.080	188.907	1,633.184	164.775	575.820	11,409.614
1954	2,580.307	2,114.052	3,588.636	687.746	200.834	1,680.298	170.366	590.801	11,613.040
1955	2,705.614	2,167.151	3,925.699	750.335	208.053	1,757.663	182.614	617.108	12,314.237
1956	2,833.857	2,479.797	4,082.820	787.702	213.474	1,855.542	207.603	631.777	13,092.571
1957	2,917.846	2,669.259	4,080.551	836.670	218.339	1,983.464	221.950	661.128	13,589.206
1958	2,898.005	2,841.852	4,033.152	801.962	224.805	2,081.942	237.624	681.333	13,800.674
1959	2,872.101	2,958.553	4,189.989	882.076	232.288	2,171.945	243.443	704.785	14,255.180

1960	2,895.345	3,060.059	4,341.918	879.841	244.125	2,303.915	284.463	750.328	14,759.995
1961	2,971.399	3,162.778	4,399.856	891.989	252.016	2,412.259	292.341	804.353	15,186.991
1962	3,148.761	3,338.034	4,587.869	904.304	253.910	2,479.761	308.135	810.551	15,831.326
1963	3,284.769	3,521.296	4,785.419	923.463	268.580	2,565.373	324.802	842.638	16,516.340
1964	3,395.985	3,527.669	4,985.442	944.696	281.582	2,668.593	343.741	871.547	17,019.255
1965	3,456.090	3,614.290	5,205.138	969.160	288.308	2,792.230	351.574	950.567	17,627.357
1966	3,481.351	3,776.254	5,469.640	997.702	293.631	2,951.057	418.444	1,050.055	18,438.135
1967	3,562.102	3,916.457	5,618.941	1,022.721	306.437	3,003.724	386.721	1,091.946	18,909.050
1968	3,713.019	4,004.919	5,916.991	1,051.425	319.329	3,136.072	446.229	1,045.540	19,633.524
1969	3,872.383	4,140.120	6,159.105	1,071.634	331.247	3,431.477	471.683	1,157.582	20,635.230
1970	4,015.085	4,269.827	6,313.053	1,101.353	347.305	3,749.364	509.818	1,237.665	21,543.469
1971	4,096.468	4,441.600	6,400.904	1,118.835	353.113	3,992.171	531.039	1,204.554	22,138.684
1972	4,164.241	4,617.376	6,688.833	1,178.703	373.884	4,158.527	556.275	1,255.674	22,993.512
1973	4,374.712	4,807.684	6,952.672	1,232.956	380.465	4,387.067	637.897	1,326.436	24,099.889
1974	4,264.250	4,972.839	6,751.425	1,295.508	394.707	4,425.020	670.049	1,330.675	24,104.472
1975	4,155.265	5,185.632	6,644.304	1,332.763	398.811	4,590.923	679.868	1,344.223	24,331.790
1976	4,351.079	5,342.624	6,943.162	1,405.253	411.474	4,728.219	740.776	1,442.799	25,365.387
1977	4,290.090	5,509.272	7,117.526	1,451.724	418.744	4,963.927	775.579	1,504.326	26,031.187
1978	4,392.794	5,695.101	7,163.982	1,506.080	414.820	5,193.887	783.181	1,508.805	26,658.651
1979	4,505.842	5,795.636	7,340.858	1,570.886	423.595	5,348.975	820.241	1,665.040	27,471.072
1980	4,465.529	5,878.724	7,135.019	1,641.257	425.674	5,397.107	735.698	1,615.659	27,294.666
1981	4,275.378	5,877.343	6,969.363	1,658.892	424.825	5,423.295	703.470	1,577.865	26,910.431
1982	4,165.221	5,988.307	6,629.545	1,676.449	429.806	5,493.969	748.823	1,636.909	26,769.029
1983	4,111.133	6,060.931	6,606.636	1,665.635	417.517	5,696.128	797.970	1,676.591	27,032.541
1984	4,001.710	6,200.037	6,934.302	1,695.472	432.365	6,045.102	858.398	1,696.950	27,864.337
1985	4,155.302	6,237.640	6,867.069	1,730.759	445.825	6,265.128	896.130	1,752.806	28,350.658
1986	4,219.041	6,347.198	6,825.811	1,785.336	452.842	6,473.629	936.329	1,782.453	28,822.638
1987	4,184.776	6,469.714	7,023.733	1,825.586	456.788	6,804.533	1,012.880	1,849.385	29,627.396
1988	4,171.432	6,499.266	7,303.355	1,860.132	468.006	7,237.694	1,076.181	1,897.748	30,513.813
1989	4,154.131	6,454.425	7,414.001	1,887.085	487.837	7,582.196	1,137.906	1,954.342	31,071.924
1990	4,175.433	6,312.043	7,361.468	1,932.577	494.320	7,795.362	1,170.754	2,064.145	31,306.101
1991	4,204.067	6,001.138	7,287.924	1,935.700	491.868	8,089.492	1,165.378	2,074.464	31,250.031
1992	4,131.950	5,574.824	7,405.710	1,990.751	495.070	8,395.931	1,237.850	2,112.071	31,344.157
1993	4,062.838	5,175.718	7,561.727	2,016.794	496.285	8,692.883	1,281.010	2,117.161	31,404.414
1994	4,057.059	4,678.452	7,674.085	2,101.921	504.305	9,121.933	1,385.740	2,210.564	31,734.059
1995	4,105.638	4,486.278	7,764.101	2,149.180	517.237	9,516.741	1,406.213	2,329.346	32,274.735
1996	4,199.889	4,371.908	8,013.279	2,187.882	528.453	9,955.866	1,484.889	2,445.548	33,187.715
1997	4,157.282	4,187.974	8,097.502	2,273.875	544.587	10,037.444	1,560.278	2,476.715	33,335.657
1998	4,170.555	4,086.929	8,101.209	2,343.441	551.614	10,029.506	1,565.141	2,463.961	33,312.357
1999	4,114.056	4,026.357	8,139.206	2,350.281	555.141	10,393.833	1,584.271	2,498.629	33,661.773
2000	4,137.366	4,052.695	8,312.818	2,410.162	563.813	10,681.215	1,685.825	2,576.586	34,420.481
2001	4,198.609	4,088.419	8,174.457	2,435.379	567.913	10,950.347	1,709.890	2,599.249	34,724.263
2002	4,158.263	4,075.169	8,224.638	2,468.951	573.642	11,511.823	1,763.361	2,560.136	35,335.984
2003	4,229.603	4,157.414	8,283.018	2,512.821	573.307	12,653.636	1,843.748	2,722.579	36,976.126
2004	4,245.220	4,176.376	8,415.701	2,614.827	588.690	13,860.346	1,976.761	2,822.412	38,700.332
2005	4,209.521	4,185.582	8,434.414	2,701.030	592.936	15,119.444	2,056.698	2,831.925	40,131.551
2006	4,186.768	4,309.722	8,345.906	2,781.786	605.670	16,045.077	2,187.676	2,866.987	41,329.593
2007	4,121.894	4,326.627	8,493.361	2,846.947	608.582	17,058.993	2,297.258	2,886.264	42,639.926
2008	4,032.303	4,337.939	8,260.734	2,899.722	614.987	17,425.618	2,390.213	3,035.264	42,996.781
2009	3,779.137	4,027.573	7,775.118	2,883.226	604.281	17,926.377	2,452.845	2,995.583	42,444.140
2010	3,833.474	4,150.879	8,035.596	2,999.131	604.478	18,683.837	2,570.129	3,113.815	43,991.339
2011	3,685.934	4,297.709	7,872.924	3,075.659	610.883	19,890.578	2,696.141	3,109.003	45,238.831
2012	3,674.841	4,294.366	7,789.013	3,160.604	605.383	20,537.494	2,784.122	3,235.311	46,081.134
2013	3,613.898	4,204.984	7,935.389	3,232.644	602.488	21,019.350	2,804.881	3,281.640	46,695.274
2014	3,428.683	4,150.124	8,040.579	3,257.601	606.217	21,267.306	2,940.565	3,351.371	47,042.445
2015	3,438.363	4,066.489	7,951.711	3,291.586	615.073	21,338.995	3,015.779	3,354.987	47,072.983
2016	3,419.198	4,118.565	7,822.081	3,288.479	612.419	21,501.609	3,184.504	3,429.251	47,376.106
2017	3,436.321	4,127.954	7,700.600	3,314.718	616.329	21,936.729	3,265.852	3,485.703	47,884.207
2018	3,361.554	4,278.198	7,996.326	3,259.969	611.028	22,424.687	3,316.388	3,504.170	48,752.321
2019	3,222.680	4,216.644	7,987.987	3,253.330	611.071	22,813.762	3,348.859	3,542.538	48,996.871
2020	2,882.461	4,012.405	7,633.190	3,023.312	577.499	22,504.251	3,290.475	3,430.266	47,353.860

World GHG Emissions Percentages per Decade

Figure B.3 Percentage of total GHG emissions per macroarea per decade 1820-2020

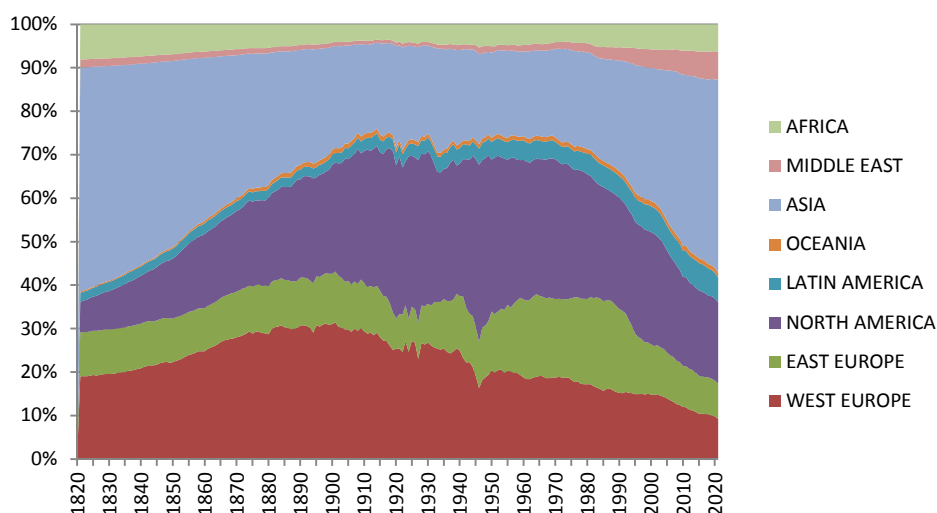


Table B.4 Percentage of World GHG emissions per macroarea per decade 1820-2020

	1	2	3	4	5	6	7	8	9
	WE	EE	NA	LA	O	As	ME	Af	WORLD
1820	26.58	14.36	5.68	3.18	0.27	44.26	2.07	3.59	100
1830	28.08	14.12	6.86	3.47	0.34	41.51	1.97	3.66	100
1840	30.07	14.15	8.22	3.58	0.44	38.26	1.81	3.48	100
1850	31.90	13.50	10.44	3.64	0.72	34.76	1.63	3.40	100
1860	35.03	13.37	12.54	3.66	0.95	29.80	1.45	3.20	100
1870	37.78	13.49	14.45	3.57	1.08	25.37	1.31	2.95	100
1880	38.24	13.69	18.02	3.33	1.26	21.55	1.17	2.74	100
1890	37.53	13.38	22.74	3.34	1.36	18.23	1.01	2.40	100
1900	37.14	13.83	25.71	3.29	1.37	15.69	0.83	2.13	100
1910	33.21	12.57	33.30	3.54	1.41	13.15	0.65	2.16	100
1920	28.87	9.87	38.10	4.05	1.58	14.25	0.70	2.57	100
1930	29.69	11.50	34.77	4.67	1.53	14.19	0.77	2.88	100
1940	25.77	16.81	31.19	5.02	1.58	15.06	1.23	3.34	100
1950	21.99	16.29	33.85	5.98	1.71	13.51	1.44	5.21	100
1960	19.62	20.73	29.42	5.96	1.65	15.61	1.93	5.08	100
1970	18.64	19.82	29.30	5.11	1.61	17.40	2.37	5.74	100
1980	16.36	21.54	26.14	6.01	1.56	19.77	2.70	5.92	100
1990	13.34	20.16	23.51	6.17	1.58	24.90	3.74	6.59	100
2000	12.02	11.77	24.15	7.00	1.64	31.03	4.90	7.49	100
2010	8.71	9.44	18.27	6.82	1.37	42.47	5.84	7.08	100
2020	6.09	8.47	16.12	6.38	1.22	47.52	6.95	7.24	100

World GHG Emissions per Source

Figure B.4 World GHG emissions per source 1820-2020 (Mtons)

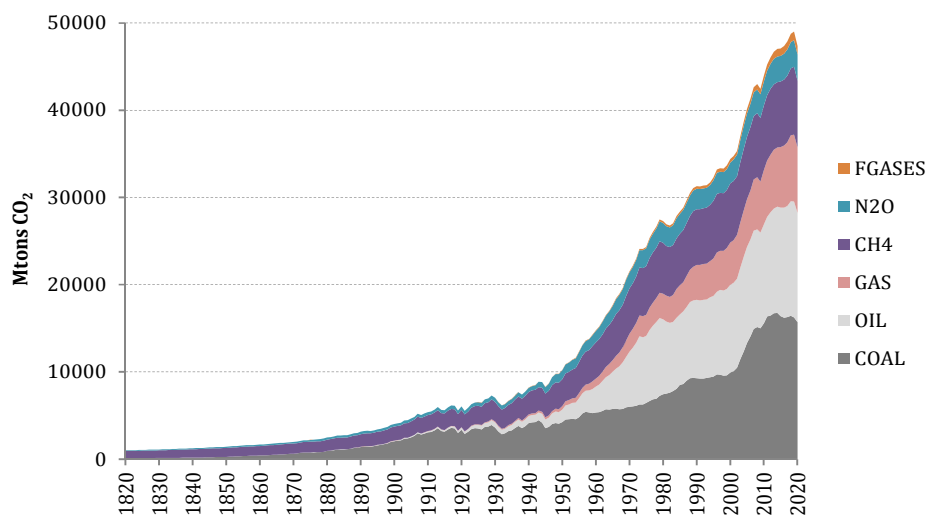


Table B.3 World GHG emissions per source 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	
1820	95.919			828.508	82.860		95.919	911.368	1,007.287
1821	97.954			833.509	84.035		97.954	917.544	1,015.498
1822	99.303			839.413	85.262		99.303	924.675	1,023.978
1823	102.120			845.099	86.461		102.120	931.560	1,033.679
1824	105.170			850.684	87.652		105.170	938.336	1,043.507
1825	107.381			856.587	88.897		107.381	945.483	1,052.864
1826	109.665			861.549	90.114		109.665	951.663	1,061.328
1827	113.473			868.536	91.505		113.473	960.041	1,073.514
1828	115.978			873.383	92.597		115.978	965.980	1,081.959
1829	117.771			878.729	93.685		117.771	972.415	1,090.185
1830	120.990			886.868	95.192		120.990	982.060	1,103.050
1831	123.022			892.978	96.749		123.022	989.727	1,112.749
1832	127.644			899.748	98.279		127.644	998.027	1,125.671
1833	131.389			906.907	99.905		131.389	1,006.811	1,138.200
1834	134.805			914.178	101.518		134.805	1,015.696	1,150.501
1835	140.307			921.113	103.397		140.307	1,024.510	1,164.817
1836	147.045			930.174	105.065		147.045	1,035.239	1,182.284
1837	153.877			936.990	106.686		153.877	1,043.676	1,197.553
1838	159.178			943.937	108.282		159.178	1,052.219	1,211.397
1839	164.898			951.112	109.916		164.898	1,061.028	1,225.926
1840	172.546			958.894	111.556		172.546	1,070.450	1,242.996
1841	178.157			965.596	113.584		178.157	1,079.180	1,257.337
1842	182.326			971.901	115.615		182.326	1,087.517	1,269.842
1843	187.965			978.857	117.870		187.965	1,096.726	1,284.691
1844	196.819			985.724	120.202		196.819	1,105.926	1,302.745
1845	212.727			993.984	122.887		212.727	1,116.870	1,329.597
1846	221.959			999.472	125.354		221.959	1,124.826	1,346.785
1847	231.139			1,007.442	128.047		231.139	1,135.488	1,366.627
1848	232.047			1,013.256	130.309		232.047	1,143.565	1,375.612
1849	242.311			1,020.846	132.686		242.311	1,153.532	1,395.843

1850	256.165			1,028.827	142.791	0.059	256.165	1,171.678	1,427.843
1851	272.540			1,032.923	145.229	0.059	272.540	1,178.211	1,450.751
1852	290.044			1,039.215	147.666	0.059	290.044	1,186.939	1,476.983
1853	307.663			1,046.406	150.087	0.059	307.663	1,196.552	1,504.216
1854	333.115			1,057.588	152.364	0.059	333.115	1,210.011	1,543.126
1855	348.484			1,063.316	154.557	0.059	348.484	1,217.933	1,566.417
1856	362.074			1,071.325	156.349	0.059	362.074	1,227.732	1,589.806
1857	374.069			1,076.633	158.281	0.059	374.069	1,234.973	1,609.042
1858	374.133			1,082.048	159.493	0.059	374.133	1,241.600	1,615.733
1859	385.967			1,089.765	160.817	0.059	385.967	1,250.640	1,636.607
1860	411.014	0.217		1,099.873	161.721	0.059	411.230	1,261.653	1,672.883
1861	423.194	0.313		1,106.137	162.059	0.059	423.506	1,268.255	1,691.762
1862	436.670	0.470		1,111.053	162.720	0.059	437.141	1,273.831	1,710.972
1863	465.054	0.603		1,119.243	163.299	0.059	465.657	1,282.602	1,748.259
1864	491.730	0.691		1,127.731	163.652	0.059	492.421	1,291.442	1,783.863
1865	512.771	0.873		1,135.645	164.226	0.059	513.645	1,299.930	1,813.574
1866	537.540	1.049		1,144.187	164.559	0.059	538.589	1,308.805	1,847.394
1867	555.437	1.194		1,150.507	165.125	0.059	556.630	1,315.691	1,872.321
1868	578.072	1.331		1,155.752	165.472	0.059	579.403	1,321.282	1,900.685
1869	606.591	1.445		1,163.898	166.162	0.059	608.036	1,330.119	1,938.156
1870	622.013	1.631		1,168.854	166.865	0.059	623.644	1,335.778	1,959.423
1871	655.409	1.795		1,181.647	169.222	0.059	657.205	1,350.927	2,008.132
1872	713.730	1.770		1,197.439	174.502	0.059	715.500	1,372.000	2,087.500
1873	760.304	2.151		1,211.142	182.027	0.059	762.455	1,393.229	2,155.684
1874	748.034	2.223		1,215.985	191.100	0.059	750.256	1,407.144	2,157.401
1875	774.421	2.634		1,230.151	201.258	0.059	777.055	1,431.468	2,208.523
1876	777.152	4.337		1,240.716	211.511	0.059	781.489	1,452.287	2,233.775
1877	787.145	6.158		1,250.759	221.341	0.059	793.303	1,472.160	2,265.462
1878	792.309	7.402		1,260.124	230.129	0.059	799.711	1,490.312	2,290.022
1879	840.774	9.250		1,274.118	236.886	0.059	850.024	1,511.063	2,361.087
1880	932.731	10.816		1,292.908	241.356	0.059	943.547	1,534.323	2,477.871
1881	974.082	11.058	0.000	1,307.875	243.750	0.059	985.140	1,551.684	2,536.825
1882	1,023.867	10.799	0.211	1,322.758	246.049	0.059	1,034.878	1,568.866	2,603.743
1883	1,088.701	10.321	0.484	1,338.626	248.069	0.059	1,099.506	1,586.754	2,686.260
1884	1,097.226	11.128	1.493	1,348.694	249.688	0.059	1,109.847	1,598.441	2,708.287
1885	1,102.459	11.999	4.731	1,357.749	251.196	0.059	1,119.189	1,609.004	2,728.193
1886	1,111.307	13.718	6.761	1,368.712	252.702	0.059	1,131.786	1,621.474	2,753.260
1887	1,186.431	16.929	8.790	1,383.416	254.144	0.059	1,212.150	1,637.619	2,849.769
1888	1,282.880	19.914	10.820	1,404.095	255.727	0.059	1,313.614	1,659.881	2,973.495
1889	1,305.642	22.036	12.849	1,414.259	257.396	0.059	1,340.527	1,671.714	3,012.241
1890	1,388.684	25.472	14.878	1,435.372	266.481	0.059	1,429.034	1,701.911	3,130.945
1891	1,445.343	28.021	13.608	1,452.493	270.234	0.068	1,486.972	1,722.794	3,209.767
1892	1,461.148	28.873	12.338	1,463.199	274.331	0.091	1,502.360	1,737.621	3,239.981
1893	1,436.717	31.907	11.069	1,470.299	278.338	0.127	1,479.693	1,748.764	3,228.457
1894	1,496.182	31.045	9.799	1,487.236	282.383	0.172	1,537.026	1,769.791	3,306.817
1895	1,576.879	36.446	8.529	1,506.908	286.379	0.222	1,621.853	1,793.510	3,415.364
1896	1,624.125	38.233	9.749	1,522.157	290.064	0.277	1,672.107	1,812.498	3,484.605
1897	1,698.830	42.068	10.969	1,540.510	293.814	0.332	1,751.867	1,834.656	3,586.523
1898	1,790.646	48.699	12.189	1,559.944	297.176	0.384	1,851.534	1,857.505	3,709.039
1899	1,964.003	48.234	13.409	1,586.456	300.826	0.430	2,025.646	1,887.713	3,913.359
1900	2,039.823	56.565	14.632	1,608.823	303.723	0.468	2,111.020	1,913.015	4,024.035
1901	2,100.679	59.879	16.251	1,627.229	306.751	0.500	2,176.808	1,934.480	4,111.288
1902	2,142.844	66.292	17.309	1,641.904	310.296	0.527	2,226.446	1,952.727	4,179.173
1903	2,338.724	72.319	18.369	1,672.018	313.995	0.554	2,429.412	1,986.567	4,415.979
1904	2,359.213	81.250	19.117	1,685.650	317.825	0.579	2,459.580	2,004.054	4,463.634
1905	2,500.862	80.775	21.545	1,707.743	321.793	0.604	2,603.182	2,030.139	4,633.321
1906	2,680.650	80.476	23.792	1,735.883	325.857	0.628	2,784.918	2,062.368	4,847.286
1907	2,954.630	100.344	25.037	1,779.654	329.758	0.654	3,080.011	2,110.065	5,190.076
1908	2,806.586	107.194	24.727	1,780.353	333.674	0.681	2,938.507	2,114.707	5,053.214
1909	2,937.366	113.147	29.586	1,805.379	336.996	0.710	3,080.099	2,143.085	5,223.184
1910	3,067.125	123.492	31.268	1,830.078	340.555	0.743	3,221.884	2,171.376	5,393.260
1911	3,117.829	129.274	32.231	1,847.621	344.381	0.778	3,279.334	2,192.780	5,472.114

1912	3,296.368	129.897	35.372	1,866.713	349.837	0.816	3,461.637	2,217.367	5,679.004
1913	3,540.526	140.668	37.194	1,902.341	356.658	0.856	3,718.388	2,259.855	5,978.243
1914	3,213.743	147.340	37.871	1,881.130	364.147	0.897	3,398.954	2,246.174	5,645.128
1915	3,143.637	159.095	40.189	1,892.414	372.185	0.943	3,342.922	2,265.541	5,608.463
1916	3,417.501	168.168	48.237	1,928.264	380.075	0.989	3,633.906	2,309.328	5,943.234
1917	3,573.094	185.859	50.839	1,954.574	388.250	1.039	3,809.792	2,343.862	6,153.655
1918	3,524.901	190.493	45.856	1,949.991	395.684	1.091	3,761.249	2,346.765	6,108.015
1919	3,002.902	205.380	47.166	1,924.750	402.236	1.143	3,255.449	2,328.130	5,583.578
1920	3,374.775	245.561	48.114	1,977.756	407.438	1.199	3,668.451	2,386.393	6,054.843
1921	2,894.647	252.818	39.831	1,945.431	412.239	1.800	3,187.296	2,359.470	5,546.766
1922	3,141.843	284.757	47.206	1,989.903	416.861	3.346	3,473.806	2,410.110	5,883.915
1923	3,423.011	346.143	61.878	2,056.928	421.555	5.614	3,831.032	2,484.097	6,315.129
1924	3,555.569	353.635	70.025	2,082.316	426.338	8.392	3,979.229	2,517.047	6,496.276
1925	3,519.063	403.418	74.043	2,104.214	430.800	11.473	3,996.524	2,546.487	6,543.011
1926	3,399.434	430.026	81.409	2,111.719	435.052	14.642	3,910.869	2,561.413	6,472.282
1927	3,677.794	453.554	89.365	2,174.283	439.111	17.654	4,220.713	2,631.047	6,851.760
1928	3,724.110	494.798	97.056	2,190.012	442.606	20.348	4,315.964	2,652.965	6,968.929
1929	3,927.454	546.376	118.510	2,241.909	446.162	22.451	4,592.340	2,710.521	7,302.861
1930	3,612.976	591.656	121.063	2,243.646	448.909	23.772	4,325.695	2,716.326	7,042.021
1931	3,182.328	549.668	107.687	2,230.412	451.203	24.324	3,839.682	2,705.939	6,545.621
1932	2,854.249	509.168	102.408	2,226.119	453.886	24.350	3,465.825	2,704.354	6,170.180
1933	2,958.000	532.544	103.810	2,262.261	456.814	23.984	3,594.355	2,743.060	6,337.414
1934	3,220.624	560.733	117.467	2,318.700	460.221	23.388	3,898.824	2,802.310	6,701.134
1935	3,297.432	631.463	127.699	2,365.927	463.756	22.644	4,056.593	2,852.327	6,908.920
1936	3,578.261	685.521	143.458	2,426.082	467.360	21.897	4,407.241	2,915.338	7,322.579
1937	3,810.727	737.953	158.671	2,474.084	472.124	21.275	4,707.351	2,967.482	7,674.834
1938	3,543.424	742.885	153.589	2,478.633	476.853	20.884	4,439.898	2,976.370	7,416.268
1939	3,751.923	800.155	165.233	2,523.319	482.116	20.883	4,717.310	3,026.319	7,743.629
1940	4,116.830	832.822	177.144	2,573.953	488.506	21.388	5,126.797	3,083.846	8,210.643
1941	4,191.304	878.740	181.247	2,615.041	506.468	22.330	5,251.291	3,143.839	8,395.130
1942	4,259.204	831.358	195.106	2,647.661	545.091	23.548	5,285.668	3,216.300	8,501.968
1943	4,457.477	880.221	216.050	2,699.652	599.204	24.999	5,553.748	3,323.855	8,877.603
1944	4,172.173	1,010.988	233.410	2,740.955	663.205	26.666	5,416.571	3,430.826	8,847.397
1945	3,537.118	1,002.266	245.924	2,724.141	737.222	28.650	4,785.308	3,490.014	8,275.322
1946	3,679.575	1,083.437	253.716	2,817.870	812.649	30.659	5,016.728	3,661.178	8,677.906
1947	4,033.209	1,193.040	280.429	2,968.107	889.602	33.073	5,506.678	3,890.782	9,397.460
1948	4,143.514	1,324.847	315.843	3,005.382	949.157	35.282	5,784.204	3,989.822	9,774.025
1949	4,077.284	1,312.705	336.696	3,031.170	993.643	37.426	5,726.685	4,062.239	9,788.924
1950	4,236.420	1,457.188	386.638	3,090.430	1,017.564	39.508	6,080.246	4,147.502	10,227.748
1951	4,525.614	1,636.390	453.890	3,194.629	1,037.037	41.851	6,615.894	4,273.516	10,889.410
1952	4,564.488	1,709.842	487.904	3,258.831	1,059.595	44.368	6,762.234	4,362.793	11,125.027
1953	4,622.992	1,807.542	516.249	3,331.802	1,083.912	47.117	6,946.783	4,462.831	11,409.614
1954	4,578.304	1,919.627	547.975	3,406.506	1,110.667	49.961	7,045.906	4,567.134	11,613.040
1955	4,812.013	2,143.963	598.008	3,567.451	1,139.804	52.999	7,553.984	4,760.253	12,314.237
1956	5,223.211	2,314.248	647.328	3,683.006	1,168.642	56.136	8,184.787	4,907.784	13,092.571
1957	5,405.140	2,432.082	706.554	3,784.960	1,201.050	59.420	8,543.777	5,045.430	13,589.206
1958	5,327.700	2,559.709	765.927	3,849.579	1,234.973	62.786	8,653.336	5,147.338	13,800.674
1959	5,279.512	2,762.931	857.808	4,023.088	1,265.473	66.369	8,900.250	5,354.930	14,255.180
1960	5,339.761	2,963.417	930.447	4,155.156	1,301.254	69.961	9,233.624	5,526.370	14,759.995
1961	5,374.368	3,154.565	995.662	4,206.242	1,382.091	74.062	9,524.595	5,662.396	15,186.991
1962	5,539.881	3,424.366	1,087.460	4,265.387	1,435.639	78.595	10,051.706	5,779.620	15,831.326
1963	5,699.901	3,691.009	1,174.793	4,382.035	1,485.218	83.384	10,565.703	5,950.637	16,516.340
1964	5,668.936	3,987.356	1,281.873	4,456.964	1,535.593	88.533	10,938.165	6,081.090	17,019.255
1965	5,739.176	4,256.987	1,344.309	4,588.987	1,603.970	93.927	11,340.472	6,286.885	17,627.357
1966	5,788.833	4,600.221	1,462.923	4,810.822	1,675.906	99.431	11,851.977	6,586.159	18,438.135
1967	5,719.651	4,909.937	1,566.086	4,871.696	1,736.686	104.994	12,195.674	6,713.375	18,909.050
1968	5,766.266	5,344.273	1,704.430	4,913.489	1,794.562	110.504	12,814.969	6,818.554	19,633.524
1969	5,921.502	5,783.054	1,866.021	5,110.262	1,838.455	115.937	13,570.577	7,064.653	20,635.230
1970	6,010.559	6,320.206	2,025.095	5,229.909	1,831.377	126.322	14,355.860	7,187.609	21,543.469
1971	6,048.662	6,702.465	2,165.311	5,228.320	1,856.599	137.327	14,916.438	7,222.246	22,138.684
1972	6,112.148	7,216.195	2,279.399	5,329.674	1,912.673	143.422	15,607.743	7,385.769	22,993.512
1973	6,272.119	7,822.941	2,379.156	5,481.615	1,984.896	159.162	16,474.216	7,625.673	24,099.889

1974	6,252.413	7,709.586	2,431.005	5,519.070	2,020.792	171.606	16,393.004	7,711.468	24,104.472
1975	6,463.293	7,657.616	2,422.289	5,553.943	2,069.581	165.068	16,543.199	7,788.592	24,331.790
1976	6,659.670	8,148.332	2,566.829	5,689.502	2,116.408	184.646	17,374.831	7,990.555	25,365.387
1977	6,841.350	8,460.801	2,632.901	5,749.209	2,145.499	201.428	17,935.051	8,096.136	26,031.187
1978	6,933.823	8,799.062	2,743.975	5,769.834	2,199.213	212.744	18,476.860	8,181.791	26,658.651
1979	7,252.087	8,922.592	2,900.734	5,919.937	2,250.559	225.165	19,075.412	8,395.660	27,471.072
1980	7,433.851	8,577.823	2,939.735	5,854.875	2,261.210	227.173	18,951.409	8,343.257	27,294.666
1981	7,512.395	8,256.632	2,978.256	5,690.770	2,245.276	227.103	18,747.282	8,163.149	26,910.431
1982	7,623.351	7,990.158	2,975.845	5,735.669	2,227.814	216.192	18,589.354	8,179.675	26,769.029
1983	7,800.529	7,938.367	3,065.582	5,744.797	2,253.640	229.626	18,804.478	8,228.063	27,032.541
1984	8,056.501	8,137.142	3,308.090	5,811.025	2,299.402	252.176	19,501.733	8,362.603	27,864.337
1985	8,491.245	8,092.095	3,334.601	5,889.937	2,291.562	251.217	19,917.941	8,432.717	28,350.658
1986	8,608.178	8,320.954	3,365.641	5,975.238	2,296.498	256.130	20,294.772	8,527.865	28,822.638
1987	8,960.556	8,469.328	3,536.983	6,058.773	2,332.550	269.206	20,966.867	8,660.528	29,627.396
1988	9,272.718	8,741.153	3,695.985	6,179.490	2,329.726	294.741	21,709.856	8,803.956	30,513.813
1989	9,324.683	8,856.940	3,867.159	6,365.224	2,346.136	311.782	22,048.782	9,023.142	31,071.924
1990	9,257.526	9,012.247	3,977.782	6,416.951	2,333.867	307.729	22,247.555	9,058.546	31,306.101
1991	9,219.995	8,955.206	4,081.347	6,387.900	2,299.488	306.094	22,256.548	8,993.483	31,250.031
1992	9,222.789	9,043.575	4,097.289	6,388.013	2,293.714	298.776	22,363.654	8,980.503	31,344.157
1993	9,300.294	8,982.395	4,131.979	6,399.464	2,294.220	296.063	22,414.668	8,989.746	31,404.414
1994	9,371.042	9,166.257	4,158.639	6,446.212	2,283.228	308.682	22,695.937	9,038.122	31,734.059
1995	9,451.680	9,260.181	4,294.333	6,576.094	2,356.614	335.832	23,006.195	9,268.540	32,274.735
1996	9,711.126	9,472.980	4,516.743	6,700.420	2,426.019	360.427	23,700.849	9,486.865	33,187.715
1997	9,688.263	9,711.623	4,480.797	6,653.977	2,413.005	387.993	23,880.683	9,454.975	33,335.657
1998	9,572.211	9,755.196	4,550.925	6,611.397	2,425.775	396.854	23,878.332	9,434.025	33,312.357
1999	9,612.705	9,915.226	4,662.099	6,640.338	2,414.794	416.611	24,190.030	9,471.743	33,661.773
2000	9,921.031	10,066.129	4,833.425	6,787.850	2,406.976	405.069	24,820.585	9,599.895	34,420.481
2001	10,072.997	10,132.879	4,890.261	6,784.873	2,449.674	393.579	25,096.137	9,628.126	34,724.263
2002	10,478.684	10,211.170	5,031.187	6,713.730	2,486.065	415.148	25,721.041	9,614.943	35,335.984
2003	11,450.139	10,469.655	5,168.084	6,922.423	2,536.897	428.929	27,087.878	9,888.248	36,976.126
2004	12,337.688	10,877.545	5,334.288	7,031.009	2,636.519	483.282	28,549.521	10,150.811	38,700.332
2005	13,322.322	11,005.104	5,474.307	7,142.793	2,655.912	531.112	29,801.733	10,329.818	40,131.551
2006	14,071.066	11,140.442	5,613.520	7,242.997	2,685.314	576.253	30,825.027	10,504.565	41,329.593
2007	14,929.204	11,271.922	5,844.702	7,260.238	2,741.971	591.889	32,045.828	10,594.098	42,639.926
2008	15,135.178	11,197.391	5,985.249	7,323.368	2,734.393	621.202	32,317.818	10,678.963	42,996.781
2009	15,009.119	10,956.752	5,848.755	7,273.240	2,738.765	617.507	31,814.627	10,629.513	42,444.140
2010	15,577.158	11,333.897	6,258.395	7,400.378	2,770.707	650.804	33,169.450	10,821.889	43,991.339
2011	16,347.473	11,405.643	6,456.492	7,508.589	2,834.398	686.237	34,209.607	11,029.224	45,238.831
2012	16,474.554	11,825.044	6,620.601	7,559.471	2,873.581	727.883	34,920.199	11,160.934	46,081.134
2013	16,713.842	12,018.284	6,736.172	7,492.073	2,928.606	806.298	35,468.298	11,226.977	46,695.274
2014	16,768.559	12,163.199	6,812.030	7,471.808	2,937.993	888.856	35,743.789	11,298.657	47,042.445
2015	16,375.872	12,444.071	6,932.003	7,522.144	2,934.736	864.156	35,751.946	11,321.037	47,072.983
2016	16,216.340	12,619.055	7,115.952	7,563.767	2,964.781	896.209	35,951.348	11,424.758	47,376.106
2017	16,280.126	12,723.736	7,310.599	7,641.505	2,996.697	931.544	36,314.460	11,569.746	47,884.207
2018	16,443.270	13,107.279	7,554.696	7,668.208	3,013.920	964.948	37,105.245	11,647.076	48,752.321
2019	16,242.139	13,291.571	7,677.761	7,751.854	3,040.981	992.565	37,211.472	11,785.400	48,996.871
2020	15,682.008	12,512.584	7,543.928	7,631.177	3,002.397	981.766	35,738.520	11,615.340	47,353.860

Decadal shares GHG emissions

Figure B.5 Percentages of any source on World GHG emissions per decade 1820-2020

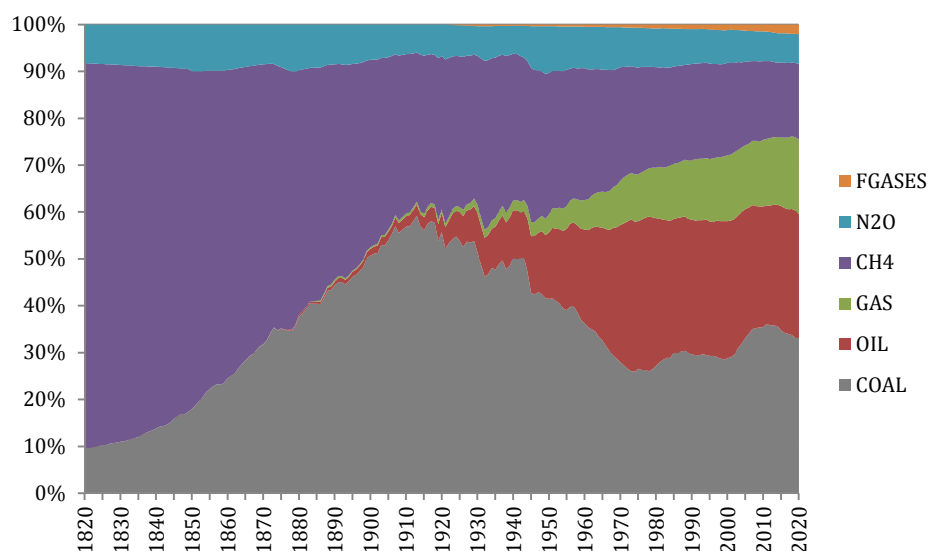


Table B.4 Percentage of any source on World GHG emissions per decade 1820-2020

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	
1820	9,52			82,25	8,23		9,52	90,48	100,0
1830	10,97			80,40	8,63		10,97	89,03	100,0
1840	13,88			77,14	8,97		13,88	86,12	100,0
1850	17,94			72,05	10,00		17,94	82,06	100,0
1860	24,57	0,01		65,75	9,67		24,58	75,42	100,0
1870	31,74	0,08		59,65	8,52		31,83	68,17	100,0
1880	37,64	0,44		52,18	9,74		38,08	61,92	100,0
1890	44,35	0,81	0,48	45,84	8,51		45,64	54,36	100,0
1900	50,69	1,41	0,36	39,98	7,55	0,01	52,46	47,54	100,0
1910	56,87	2,29	0,58	33,93	6,31	0,01	59,74	40,26	100,0
1920	55,74	4,06	0,79	32,66	6,73	0,02	60,59	39,41	100,0
1930	51,31	8,40	1,72	31,86	6,37	0,34	61,43	38,57	100,0
1940	50,14	10,14	2,16	31,35	5,95	0,26	62,44	37,56	100,0
1950	41,42	14,25	3,78	30,22	9,95	0,39	59,45	40,55	100,0
1960	36,18	20,08	6,30	28,15	8,82	0,47	62,56	37,44	100,0
1970	27,90	29,34	9,40	24,28	8,50	0,59	66,64	33,36	100,0
1980	27,24	31,43	10,77	21,45	8,28	0,83	69,43	30,57	100,0
1990	29,57	28,79	12,71	20,50	7,45	0,98	71,06	28,94	100,0
2000	28,82	29,24	14,04	19,72	6,99	1,18	72,11	27,89	100,0
2010	35,41	25,76	14,23	16,82	6,30	1,48	75,40	24,60	100,0
2020	33,12	26,42	15,93	16,12	6,34	2,07	75,47	24,53	100,0

Western Europe GHG emissions

Figure B.6 Total and per capita GHG emissions per source in Western Europe 1820-2020 (Mtons and tons)

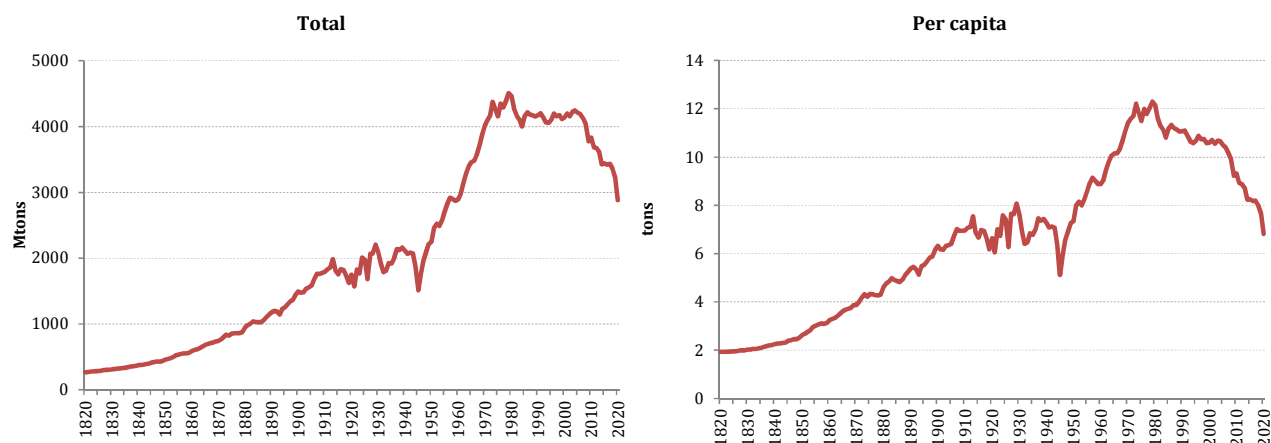


Table B.5 Total GHG emissions per source in Western Europe 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	
1820	85.974			172.450	9.302		85.974	181.752	267.726
1821	87.825			173.538	9.411		87.825	182.948	270.773
1822	89.005			175.335	9.522		89.005	184.857	273.863
1823	91.356			177.190	9.642		91.356	186.832	278.188
1824	94.175			178.870	9.733		94.175	188.603	282.778
1825	96.157			180.500	9.871		96.157	190.371	286.528
1826	98.352			181.578	9.974		98.352	191.551	289.904
1827	101.868			184.130	10.122		101.868	194.252	296.120
1828	104.215			185.463	10.229		104.215	195.692	299.907
1829	105.941			186.785	10.303		105.941	197.088	303.029
1830	108.442			190.840	10.491		108.442	201.331	309.773
1831	110.502			191.453	10.566		110.502	202.018	312.520
1832	114.003			192.940	10.635		114.003	203.575	317.578
1833	117.149			194.405	10.775		117.149	205.180	322.329
1834	120.440			196.315	10.910		120.440	207.225	327.665
1835	124.789			197.805	11.032		124.789	208.837	333.626
1836	130.854			201.515	11.209		130.854	212.724	343.578
1837	136.916			202.255	11.341		136.916	213.596	350.512
1838	142.111			203.968	11.477		142.111	215.444	357.555
1839	146.990			205.658	11.597		146.990	217.255	364.244
1840	153.792			208.143	11.785		153.792	219.927	373.720
1841	158.569			208.738	11.950		158.569	220.688	379.257
1842	161.679			209.333	12.142		161.679	221.475	383.153
1843	166.606			209.875	12.231		166.606	222.106	388.712
1844	173.261			210.968	12.403		173.261	223.370	396.632
1845	186.446			212.865	12.644		186.446	225.509	411.956
1846	193.651			212.508	12.786		193.651	225.293	418.944
1847	200.033			214.438	12.976		200.033	227.414	427.447
1848	198.905			214.190	13.052		198.905	227.242	426.147
1849	207.806			215.743	13.228		207.806	228.971	436.777

1850	219.595		217.615	18.191	0.015	219.595	235.821	455.416
1851	230.266		216.548	18.489	0.015	230.266	235.052	465.318
1852	244.478		216.993	18.778	0.015	244.478	235.785	480.264
1853	257.749		218.410	19.081	0.015	257.749	237.506	495.254
1854	276.842		223.868	19.354	0.015	276.842	243.236	520.079
1855	287.799		223.665	19.613	0.015	287.799	243.294	531.093
1856	297.326		226.068	19.831	0.015	297.326	245.914	543.240
1857	306.893		225.898	20.021	0.015	306.893	245.933	552.826
1858	307.029		225.270	20.212	0.015	307.029	245.497	552.526
1859	312.815		227.603	20.366	0.015	312.815	247.984	560.798
1860	333.775		231.758	20.504	0.015	333.775	252.276	586.052
1861	346.663		234.385	20.598	0.015	346.663	254.999	601.662
1862	356.859	0.056	234.703	20.693	0.015	356.915	255.411	612.326
1863	375.337	0.085	237.273	20.758	0.015	375.422	258.046	633.467
1864	395.671	0.068	240.853	20.849	0.015	395.739	261.717	657.456
1865	413.623	0.149	243.940	20.910	0.015	413.772	264.866	678.638
1866	425.518	0.294	246.555	21.035	0.015	425.812	267.605	693.417
1867	436.747	0.399	248.240	21.093	0.015	437.146	269.348	706.494
1868	445.940	0.473	248.358	21.182	0.015	446.413	269.554	715.968
1869	461.223	0.565	250.710	21.282	0.015	461.787	272.008	733.795
1870	468.387	0.726	249.723	21.377	0.015	469.113	271.115	740.228
1871	489.948	0.904	252.765	21.680	0.015	490.853	274.461	765.313
1872	520.380	0.874	258.480	22.252	0.015	521.254	280.747	802.001
1873	549.823	1.168	262.420	23.087	0.015	550.991	285.523	836.514
1874	537.998	1.091	258.965	24.116	0.015	539.089	283.096	822.185
1875	560.512	1.351	264.463	25.196	0.015	561.862	289.674	851.536
1876	562.588	1.547	265.273	26.316	0.015	564.135	291.604	855.739
1877	560.572	1.839	265.850	27.405	0.015	562.410	293.270	855.681
1878	564.142	1.647	266.410	28.382	0.015	565.789	294.807	860.596
1879	576.090	1.887	268.150	29.121	0.015	577.977	297.286	875.263
1880	639.847	1.836	276.320	29.642	0.015	641.683	305.977	947.661
1881	668.094	2.294	279.940	29.937	0.015	670.388	309.892	980.280
1882	688.076	2.469	282.718	30.205	0.015	690.545	312.938	1,003.484
1883	719.861	2.671	286.790	30.432	0.015	722.532	317.237	1,039.769
1884	710.770	2.910	285.440	30.691	0.015	713.679	316.146	1,029.826
1885	709.066	3.630	284.043	30.876	0.015	712.696	314.934	1,027.630
1886	706.931	3.400	284.215	31.067	0.015	710.332	315.297	1,025.628
1887	733.768	3.571	287.433	31.239	0.015	737.339	318.687	1,056.026
1888	773.887	4.235	291.793	31.463	0.015	778.123	323.271	1,101.393
1889	805.759	4.476	295.523	31.713	0.015	810.235	327.251	1,137.486
1890	839.786	4.592	300.365	30.280	0.015	844.379	330.660	1,175.039
1891	857.523	5.038	303.155	32.601	0.018	862.561	335.774	1,198.334
1892	844.923	5.244	302.235	34.774	0.024	850.167	337.032	1,187.199
1893	802.070	5.657	297.158	36.800	0.033	807.727	333.990	1,141.717
1894	880.721	5.855	307.058	38.674	0.044	886.576	345.776	1,232.352
1895	897.401	6.287	309.333	40.412	0.058	903.687	349.802	1,253.489
1896	933.210	6.574	314.140	41.854	0.072	939.784	356.066	1,295.850
1897	973.473	6.728	319.380	43.180	0.086	980.201	362.646	1,342.847
1898	992.849	7.224	322.010	44.164	0.099	1,000.073	366.273	1,366.346
1899	1,059.396	7.398	329.890	44.950	0.111	1,066.794	374.952	1,441.746
1900	1,105.119	7.807	335.965	45.442	0.121	1,112.928	381.528	1,494.456
1901	1,084.762	7.824	334.020	45.627	0.129	1,092.589	379.776	1,472.365
1902	1,093.320	8.186	335.175	45.603	0.137	1,101.509	380.915	1,482.424
1903	1,139.963	8.431	342.065	45.379	0.144	1,148.398	387.588	1,535.986
1904	1,157.314	8.656	343.250	45.019	0.150	1,165.975	388.419	1,554.394
1905	1,180.912	8.447	347.563	44.694	0.156	1,189.365	392.413	1,581.777
1906	1,274.137	8.528	352.528	44.274	0.163	1,282.676	396.964	1,679.640
1907	1,344.040	8.766	365.160	43.913	0.169	1,352.817	409.242	1,762.060
1908	1,340.267	9.499	365.530	43.746	0.176	1,349.779	409.453	1,759.231
1909	1,352.958	9.710	367.970	43.693	0.184	1,362.684	411.847	1,774.531
1910	1,367.771	9.621	369.890	43.809	0.192	1,377.409	413.891	1,791.300
1911	1,405.952	9.850	374.315	44.122	0.202	1,415.819	418.638	1,834.457

1912	1,426.202	11.054	0.013	374.313	44.414	0.212	1,437.269	418.938	1,856.207
1913	1,539.176	13.220	0.012	386.351	44.720	0.222	1,552.407	431.293	1,983.700
1914	1,391.643	9.835	0.011	365.410	45.034	0.232	1,401.490	410.676	1,812.166
1915	1,337.891	9.166	0.011	359.460	45.403	0.244	1,347.068	405.107	1,752.175
1916	1,412.115	8.025	0.011	366.833	45.749	0.256	1,420.151	412.838	1,832.988
1917	1,390.824	11.509	0.013	368.953	46.127	0.269	1,402.346	415.349	1,817.695
1918	1,310.730	16.410	0.013	357.835	46.521	0.283	1,327.153	404.639	1,731.792
1919	1,213.429	11.061	0.016	351.053	46.977	0.297	1,224.507	398.326	1,622.832
1920	1,318.558	14.164	0.014	367.448	47.402	0.310	1,332.736	415.160	1,747.896
1921	1,161.766	17.142	0.015	343.398	47.918	0.463	1,178.922	391.779	1,570.701
1922	1,391.086	17.977	0.012	365.475	48.592	0.855	1,409.075	414.922	1,823.997
1923	1,327.444	21.328	0.013	369.400	49.301	1.431	1,348.784	420.132	1,768.917
1924	1,540.395	25.596	0.012	388.750	50.147	2.136	1,566.003	441.034	2,007.037
1925	1,503.479	33.369	0.013	384.600	50.979	2.913	1,536.861	438.492	1,975.353
1926	1,232.642	39.031	0.011	354.100	51.843	3.724	1,271.684	409.667	1,681.351
1927	1,569.161	43.325	0.011	393.850	52.713	4.483	1,612.497	451.046	2,063.543
1928	1,574.478	48.502	0.012	389.675	53.518	5.168	1,622.992	448.361	2,071.353
1929	1,690.957	51.635	0.013	402.550	54.230	5.709	1,742.606	462.489	2,205.095
1930	1,575.281	60.015	0.017	394.575	54.868	6.040	1,635.314	455.483	2,090.797
1931	1,415.177	59.544	0.024	379.350	55.708	6.185	1,474.745	441.243	1,915.988
1932	1,295.670	59.712	0.026	366.375	57.031	6.194	1,355.408	429.600	1,785.008
1933	1,312.293	66.719	0.027	368.400	58.590	6.116	1,379.039	433.105	1,812.144
1934	1,409.117	72.966	0.030	376.825	60.482	5.979	1,482.114	443.286	1,925.400
1935	1,393.503	78.712	0.026	378.925	62.511	5.803	1,472.242	447.239	1,919.481
1936	1,456.006	86.621	0.028	385.825	64.600	5.619	1,542.655	456.045	1,998.699
1937	1,588.610	79.151	0.032	399.475	66.698	5.465	1,667.793	471.639	2,139.432
1938	1,572.425	83.656	0.036	394.375	68.582	5.384	1,656.117	468.340	2,124.457
1939	1,605.494	82.777	0.042	398.300	70.358	5.386	1,688.313	474.044	2,162.357
1940	1,584.601	65.899	0.058	388.400	71.732	5.520	1,650.558	465.652	2,116.210
1941	1,541.811	51.666	0.078	389.500	74.718	5.739	1,593.555	469.956	2,063.511
1942	1,560.150	42.594	0.102	394.625	80.681	6.002	1,602.846	481.307	2,084.154
1943	1,523.921	56.236	0.200	397.325	88.899	6.293	1,580.357	492.517	2,072.874
1944	1,314.643	70.163	0.229	380.675	98.718	6.610	1,385.035	486.003	1,871.038
1945	977.919	63.192	0.419	353.450	109.393	6.960	1,041.530	469.803	1,511.333
1946	1,184.024	85.215	0.655	367.575	120.252	7.335	1,269.893	495.162	1,765.055
1947	1,320.319	102.616	0.840	402.350	130.464	7.731	1,423.775	540.546	1,964.321
1948	1,393.582	135.144	1.403	413.375	139.524	8.151	1,530.128	561.049	2,091.178
1949	1,487.176	139.299	1.091	428.850	146.273	8.599	1,627.566	583.723	2,211.288
1950	1,500.312	154.964	2.960	431.571	150.583	9.053	1,658.235	591.207	2,249.443
1951	1,640.832	198.446	3.646	451.124	154.124	9.553	1,842.924	614.802	2,457.726
1952	1,688.154	207.153	4.490	454.925	159.102	10.081	1,899.797	624.108	2,523.905
1953	1,627.262	222.817	6.805	458.351	165.101	10.673	1,856.885	634.125	2,491.010
1954	1,650.285	269.903	8.486	468.302	172.028	11.304	1,928.673	651.634	2,580.307
1955	1,710.485	310.426	10.372	482.429	179.923	11.978	2,031.283	674.331	2,705.614
1956	1,788.046	337.338	12.651	495.107	188.036	12.679	2,138.035	695.822	2,833.857
1957	1,824.598	367.598	14.523	500.933	196.784	13.411	2,206.719	711.127	2,917.846
1958	1,761.235	403.641	15.591	497.482	205.874	14.181	2,180.467	717.538	2,898.005
1959	1,665.489	461.217	20.140	495.707	214.572	14.976	2,146.847	725.254	2,872.101
1960	1,604.506	519.712	24.489	508.034	222.819	15.786	2,148.707	746.638	2,895.345
1961	1,589.532	580.960	28.079	518.435	237.697	16.695	2,198.571	772.828	2,971.399
1962	1,646.823	675.553	31.036	527.687	249.944	17.718	2,353.413	795.349	3,148.761
1963	1,665.731	772.887	32.621	535.638	259.005	18.886	2,471.240	813.529	3,284.769
1964	1,647.992	889.146	35.856	533.988	268.900	20.103	2,572.994	822.991	3,395.985
1965	1,577.417	999.305	39.528	536.813	281.656	21.369	2,616.251	839.839	3,456.090
1966	1,481.091	1,100.106	46.255	537.188	293.996	22.715	2,627.452	853.899	3,481.351
1967	1,444.106	1,189.939	58.626	538.614	306.842	23.976	2,692.671	869.431	3,562.102
1968	1,426.926	1,313.450	82.821	546.590	317.989	25.244	2,823.197	889.822	3,713.019
1969	1,398.575	1,451.094	113.503	555.592	327.109	26.511	2,963.172	909.211	3,872.383
1970	1,325.302	1,639.879	146.140	562.068	312.713	28.983	3,111.321	903.763	4,015.085
1971	1,286.160	1,711.576	192.107	557.717	318.883	30.024	3,189.844	906.624	4,096.468
1972	1,181.866	1,835.770	246.698	544.190	323.950	31.767	3,264.334	899.907	4,164.241
1973	1,197.836	1,963.418	286.610	551.791	339.448	35.609	3,447.864	926.848	4,374.712

1974	1,151.280	1,843.132	329.562	548.765	353.248	38.263	3,323.973	940.277	4,264.250
1975	1,135.533	1,736.582	351.072	548.415	347.287	36.377	3,223.186	932.079	4,155.265
1976	1,171.412	1,859.580	379.183	547.340	353.874	39.689	3,410.176	940.903	4,351.079
1977	1,146.109	1,815.449	386.834	543.840	354.082	43.775	3,348.392	941.697	4,290.090
1978	1,158.240	1,881.753	400.365	542.914	364.246	45.275	3,440.359	952.435	4,392.794
1979	1,206.445	1,909.087	425.765	549.841	367.852	46.852	3,541.297	964.545	4,505.842
1980	1,273.368	1,816.880	422.208	550.791	353.665	48.617	3,512.456	953.073	4,465.529
1981	1,240.436	1,678.911	412.205	548.015	347.019	48.792	3,331.552	943.826	4,275.378
1982	1,251.219	1,584.913	397.668	545.140	339.776	46.506	3,233.799	931.422	4,165.221
1983	1,219.872	1,547.110	415.002	538.114	343.293	47.743	3,181.984	929.149	4,111.133
1984	1,102.168	1,547.640	434.991	517.360	348.658	50.893	3,084.799	916.911	4,001.710
1985	1,254.885	1,521.218	453.888	531.763	345.230	48.317	3,229.992	925.310	4,155.302
1986	1,237.890	1,590.413	463.861	534.988	341.326	50.563	3,292.164	926.877	4,219.041
1987	1,222.508	1,558.010	490.417	524.211	336.259	53.371	3,270.934	913.841	4,184.776
1988	1,208.666	1,577.748	481.016	518.460	328.689	56.852	3,267.431	904.001	4,171.432
1989	1,181.596	1,574.870	496.330	515.760	328.003	57.572	3,252.796	901.335	4,154.131
1990	1,155.371	1,604.082	514.190	526.162	317.422	58.206	3,273.643	901.790	4,175.433
1991	1,110.065	1,642.488	556.438	522.486	315.545	57.044	3,308.992	895.075	4,204.067
1992	1,025.824	1,671.185	552.078	518.860	308.719	55.283	3,249.087	882.863	4,131.950
1993	948.546	1,653.667	584.421	518.285	300.195	57.723	3,186.634	876.203	4,062.838
1994	935.858	1,661.654	586.170	507.634	303.950	61.793	3,183.681	873.377	4,057.059
1995	917.402	1,676.951	633.241	508.234	304.159	65.652	3,227.593	878.044	4,105.638
1996	899.019	1,710.577	702.930	506.058	310.418	70.886	3,312.526	887.363	4,199.889
1997	863.972	1,714.856	700.113	497.207	306.782	74.352	3,278.941	878.341	4,157.282
1998	848.169	1,743.694	729.264	487.280	288.064	74.083	3,321.127	849.428	4,170.555
1999	805.927	1,732.217	761.872	478.979	269.526	65.535	3,300.016	814.040	4,114.056
2000	844.830	1,710.406	784.001	468.777	264.459	64.894	3,339.236	798.130	4,137.366
2001	851.319	1,753.693	811.391	459.276	260.704	62.226	3,416.403	782.205	4,198.609
2002	844.361	1,733.461	816.340	447.274	251.792	65.035	3,394.163	764.100	4,158.263
2003	870.642	1,749.368	855.788	437.472	248.424	67.909	3,475.798	753.805	4,229.603
2004	867.533	1,757.025	879.966	422.320	248.424	69.953	3,504.524	740.696	4,245.220
2005	835.520	1,747.827	900.339	410.468	241.867	73.500	3,483.686	725.835	4,209.521
2006	848.080	1,749.327	882.719	399.166	230.630	76.846	3,480.126	706.642	4,186.768
2007	852.030	1,687.995	876.535	393.465	230.779	81.090	3,416.559	705.335	4,121.894
2008	777.009	1,674.694	893.770	383.288	219.454	84.088	3,345.474	686.830	4,032.303
2009	678.000	1,578.575	853.171	375.387	211.579	82.425	3,109.746	669.391	3,779.137
2010	696.521	1,573.035	909.854	366.410	201.520	86.133	3,179.410	654.063	3,833.474
2011	719.009	1,512.111	813.019	358.209	194.924	88.662	3,044.139	641.795	3,685.934
2012	770.497	1,473.088	791.696	355.184	194.063	90.315	3,035.280	639.561	3,674.841
2013	748.892	1,452.454	780.255	346.582	193.750	91.966	2,981.600	632.298	3,613.898
2014	692.853	1,416.238	690.859	340.256	196.146	92.330	2,799.950	628.732	3,428.683
2015	669.662	1,420.283	725.517	339.756	195.470	87.675	2,815.462	622.901	3,438.363
2016	588.631	1,432.877	779.867	335.349	193.875	88.600	2,801.374	617.825	3,419.198
2017	566.744	1,448.557	802.645	335.500	196.305	86.570	2,817.946	618.374	3,436.321
2018	527.278	1,439.153	789.789	331.300	191.331	82.704	2,756.220	605.335	3,361.554
2019	396.411	1,420.897	810.735	326.599	189.528	78.510	2,628.043	594.637	3,222.680
2020	307.545	1,214.585	774.351	323.495	185.200	77.285	2,296.481	585.980	2,882.461

Eastern Europe GHG emissions

Figure B.7 Total and per capita GHG emissions per source in Eastern Europe 1820-2020 (Mtons and tons)

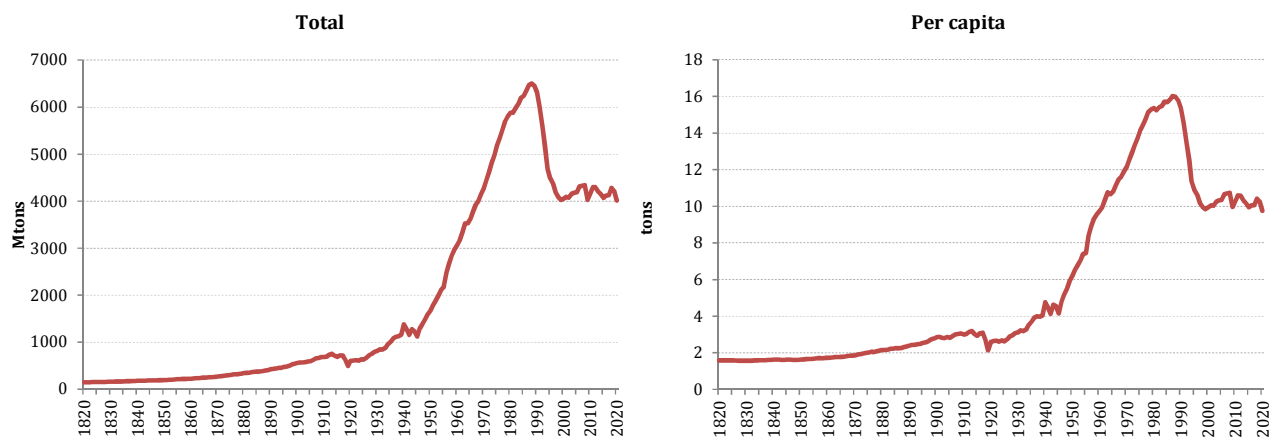


Table B.6 Total GHG emissions per source in Eastern Europe 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils Total	Gases Total	Total
1820	0.944			124.736	19.000		0.944	143.735	144.680
1821	1.045			125.553	19.165		1.045	144.718	145.763
1822	1.145			126.554	19.336		1.145	145.891	147.035
1823	1.538			127.379	19.470		1.538	146.849	148.387
1824	1.609			128.167	19.633		1.609	147.800	149.409
1825	1.674			129.145	19.805		1.674	148.950	150.624
1826	1.538			129.940	19.935		1.538	149.874	151.413
1827	1.649			130.963	20.100		1.649	151.063	152.713
1828	1.527			131.710	20.234		1.527	151.944	153.471
1829	1.346			132.480	20.401		1.346	152.880	154.226
1830	1.652			133.501	20.576		1.652	154.077	155.729
1831	1.420			135.056	20.857		1.420	155.913	157.334
1832	1.723			136.614	21.087		1.723	157.701	159.424
1833	1.767			138.235	21.336		1.767	159.571	161.338
1834	1.924			139.796	21.594		1.924	161.390	163.314
1835	2.040			141.341	21.848		2.040	163.189	165.229
1836	2.286			142.947	22.111		2.286	165.058	167.344
1837	2.431			144.528	22.366		2.431	166.894	169.325
1838	2.696			146.111	22.621		2.696	168.732	171.428
1839	2.995			147.661	22.878		2.995	170.540	173.535
1840	3.430			149.259	23.139		3.430	172.398	175.828
1841	3.747			150.245	23.309		3.747	173.553	177.300
1842	3.935			151.157	23.497		3.935	174.654	178.589
1843	3.841			152.373	23.690		3.841	176.064	179.905
1844	4.300			153.361	23.865		4.300	177.226	181.526
1845	4.980			154.248	24.056		4.980	178.304	183.284
1846	5.375			155.236	24.225		5.375	179.461	184.836
1847	5.512			156.178	24.429		5.512	180.608	186.120
1848	5.661			157.096	24.584		5.661	181.679	187.341
1849	5.313			158.056	24.780		5.313	182.836	188.149
1850	5.601			159.021	28.116	0.008	5.601	187.145	192.745
1851	6.144			160.853	28.645	0.008	6.144	189.506	195.650

1852	7.106		162.657	29.132	0.008	7.106	191.796	198.902
1853	7.878		164.463	29.629	0.008	7.878	194.100	201.978
1854	8.480		166.267	30.079	0.008	8.480	196.354	204.834
1855	9.952		168.106	30.519	0.008	9.952	198.632	208.584
1856	11.220		169.935	30.880	0.008	11.220	200.822	212.042
1857	12.199		171.761	31.251	0.008	12.199	203.020	215.219
1858	11.342		173.678	31.515	0.008	11.342	205.201	216.543
1859	13.815		175.317	31.731	0.008	13.815	207.056	220.871
1860	14.639	0.011	177.152	31.881	0.008	14.650	209.042	223.692
1861	16.173	0.008	178.824	31.988	0.008	16.181	210.820	227.001
1862	17.967	0.011	180.594	32.093	0.008	17.978	212.694	230.673
1863	19.755	0.017	182.605	32.194	0.008	19.772	214.806	234.578
1864	21.228	0.023	184.337	32.298	0.008	21.251	216.642	237.893
1865	23.774	0.025	186.141	32.364	0.008	23.799	218.513	242.312
1866	25.269	0.031	187.942	32.462	0.008	25.300	220.413	245.713
1867	28.517	0.045	190.032	32.530	0.008	28.562	222.570	251.132
1868	31.351	0.082	191.751	32.667	0.008	31.433	224.426	255.859
1869	33.606	0.079	193.487	32.741	0.008	33.685	226.236	259.921
1870	36.086	0.079	195.193	32.873	0.008	36.165	228.073	264.238
1871	42.469	0.065	197.945	33.340	0.008	42.534	231.293	273.827
1872	44.770	0.071	200.642	34.449	0.008	44.841	235.099	279.940
1873	47.890	0.158	203.251	36.039	0.008	48.048	239.299	287.347
1874	51.548	0.308	206.022	37.894	0.008	51.856	243.923	295.779
1875	52.377	0.460	208.646	40.014	0.008	52.838	248.668	301.505
1876	55.761	0.717	212.277	42.135	0.008	56.478	254.420	310.898
1877	53.711	0.997	214.577	44.185	0.008	54.708	258.771	313.479
1878	58.488	1.183	217.616	45.984	0.008	59.671	263.608	323.279
1879	62.386	1.477	220.446	47.404	0.008	63.863	267.858	331.720
1880	66.001	1.669	223.203	48.279	0.008	67.670	271.491	339.160
1881	67.280	2.290	226.426	48.800	0.008	69.570	275.234	344.804
1882	69.650	2.494	229.113	49.271	0.008	72.144	278.392	350.536
1883	77.199	2.703	232.360	49.671	0.008	79.902	282.039	361.941
1884	77.809	3.897	235.537	50.027	0.008	81.706	285.572	367.278
1885	80.679	4.945	238.940	50.350	0.008	85.624	289.298	374.922
1886	82.102	5.086	241.532	50.663	0.008	87.189	292.203	379.392
1887	83.203	6.450	244.624	50.950	0.008	89.653	295.582	385.235
1888	90.351	7.015	247.881	51.309	0.008	97.366	299.197	396.563
1889	96.998	7.032	251.037	51.635	0.008	104.030	302.680	406.710
1890	102.642	8.628	254.641	53.024	0.008	111.270	307.673	418.943
1891	108.869	10.486	259.233	53.435	0.009	119.354	312.677	432.032
1892	108.241	10.887	261.968	53.855	0.012	119.127	315.836	434.963
1893	116.080	12.866	266.077	54.227	0.017	128.946	320.321	449.267
1894	119.868	11.886	268.611	54.636	0.023	131.754	323.270	455.025
1895	126.483	16.334	273.809	55.008	0.030	142.817	328.847	471.664
1896	132.560	16.890	277.141	55.312	0.038	149.450	332.491	481.941
1897	142.862	18.977	281.726	55.672	0.045	161.839	337.444	499.283
1898	155.139	24.145	286.979	55.965	0.052	179.284	342.996	522.281
1899	166.627	22.900	291.800	56.235	0.058	189.526	348.094	537.620
1900	173.368	29.550	297.174	56.422	0.063	202.918	353.659	556.577
1901	179.188	30.128	303.101	56.628	0.068	209.316	359.797	569.113
1902	174.176	28.902	306.275	56.816	0.072	203.077	363.162	566.239
1903	180.223	26.840	309.569	57.003	0.075	207.063	366.646	573.709
1904	189.806	28.522	315.536	57.179	0.079	218.329	372.793	591.121
1905	196.976	21.990	316.344	57.348	0.082	218.966	373.774	592.741
1906	213.443	24.873	324.070	57.595	0.085	238.316	381.751	620.067
1907	236.303	27.340	330.865	57.795	0.089	263.643	388.749	652.392
1908	242.438	28.923	335.676	58.020	0.092	271.361	393.789	665.150
1909	247.248	32.249	341.449	58.258	0.096	279.497	399.803	679.300
1910	242.074	31.672	345.668	58.558	0.101	273.746	404.327	678.073
1911	256.594	30.014	346.045	59.365	0.106	286.608	405.516	692.124
1912	288.476	29.754	349.586	61.126	0.111	318.230	410.823	729.053
1913	309.617	28.226	351.396	63.659	0.116	337.843	415.171	753.014

1914	267.084	29.582		347.184	66.767	0.122	296.666	414.073	710.739
1915	236.915	32.638		344.874	70.223	0.128	269.553	415.225	684.777
1916	265.552	32.859		344.956	73.472	0.134	298.411	418.563	716.974
1917	273.202	28.984		340.528	76.962	0.141	302.185	417.631	719.817
1918	212.227	15.349		322.533	80.113	0.148	227.577	402.794	630.370
1919	78.700	17.366		313.425	82.972	0.155	96.066	396.553	492.619
1920	180.189	16.365		315.946	84.940	0.163	196.554	401.049	597.603
1921	183.462	16.172		317.615	86.530	0.254	199.634	404.399	604.033
1922	183.471	19.441	1.260	320.328	88.619	0.491	204.172	409.438	613.609
1923	167.083	21.853	1.518	323.640	90.583	0.838	190.454	415.061	605.514
1924	183.990	23.574	1.776	328.421	92.923	1.259	209.340	422.604	631.944
1925	176.566	24.830	2.034	331.139	94.906	1.734	203.430	427.779	631.209
1926	201.715	29.117	2.293	339.219	96.822	2.212	233.124	438.253	671.377
1927	241.558	32.514	2.551	347.640	98.514	2.672	276.623	448.825	725.448
1928	256.883	35.064	2.809	352.006	99.976	3.078	294.757	455.060	749.817
1929	286.916	38.249	3.581	359.321	101.135	3.385	328.746	463.841	792.587
1930	275.722	49.557	4.353	374.740	101.793	3.573	329.633	480.106	809.738
1931	289.437	59.158	5.125	387.759	101.606	3.641	353.720	493.006	846.727
1932	284.577	54.163	5.897	392.936	100.536	3.627	344.637	497.099	841.737
1933	309.305	56.038	6.669	400.455	99.055	3.540	372.012	503.050	875.062
1934	357.797	66.797	7.441	416.049	97.312	3.424	432.036	516.785	948.821
1935	398.281	71.819	8.213	427.160	95.166	3.285	478.313	525.612	1,003.924
1936	449.284	81.292	8.985	439.874	93.034	3.137	539.560	536.045	1,075.606
1937	476.448	85.219	9.757	444.634	91.377	3.019	571.425	539.029	1,110.454
1938	473.577	92.059	9.884	452.447	90.053	2.931	575.520	545.431	1,120.952
1939	497.156	104.849	10.012	455.353	89.495	2.904	612.017	547.752	1,159.769
1940	692.911	105.228	10.140	478.977	89.896	2.969	808.278	571.843	1,380.121
1941	598.234	109.401	10.269	465.671	92.058	3.086	717.904	560.815	1,278.719
1942	493.254	106.868	10.397	443.630	97.017	3.227	610.520	543.873	1,154.393
1943	606.581	96.868	10.526	451.830	104.140	3.380	713.975	559.349	1,273.324
1944	535.405	119.697	10.654	451.880	112.545	3.546	665.756	567.971	1,233.728
1945	476.167	72.483	10.992	432.820	124.318	3.807	559.642	560.945	1,120.587
1946	604.153	84.184	11.578	452.419	137.190	4.094	699.915	593.703	1,293.618
1947	663.410	93.598	13.080	468.769	147.303	4.328	770.087	620.400	1,390.487
1948	733.682	99.876	17.194	470.922	155.047	4.518	850.751	630.487	1,481.238
1949	813.825	112.122	22.760	479.208	160.354	4.701	948.707	644.262	1,592.970
1950	877.747	117.271	20.544	481.969	163.554	4.890	1,015.563	650.413	1,665.976
1951	953.386	129.392	23.680	497.666	168.061	5.151	1,106.458	670.879	1,777.337
1952	1,018.559	144.530	26.445	514.370	173.487	5.445	1,189.534	693.302	1,882.836
1953	1,085.344	159.522	29.065	530.040	179.617	5.768	1,273.931	715.425	1,989.356
1954	1,162.874	177.478	31.058	550.442	186.081	6.119	1,371.410	742.642	2,114.052
1955	1,142.361	208.975	34.870	581.432	193.022	6.490	1,386.206	780.945	2,167.151
1956	1,378.696	242.360	42.680	609.174	200.010	6.878	1,663.736	816.061	2,479.797
1957	1,479.789	278.464	58.202	638.530	206.991	7.284	1,816.454	852.805	2,669.259
1958	1,567.046	310.561	80.839	661.499	214.203	7.705	1,958.445	883.407	2,841.852
1959	1,614.205	338.308	98.530	678.456	220.904	8.150	2,051.043	907.509	2,958.553
1960	1,636.594	371.889	120.939	694.769	227.274	8.593	2,129.423	930.636	3,060.059
1961	1,656.424	406.569	147.214	698.480	245.004	9.086	2,210.208	952.570	3,162.778
1962	1,704.244	462.062	179.784	727.404	254.875	9.665	2,346.090	991.945	3,338.034
1963	1,766.313	509.607	217.197	756.090	261.775	10.314	2,493.117	1,028.179	3,521.296
1964	1,667.636	552.898	259.589	768.234	268.301	11.012	2,480.122	1,047.547	3,527.669
1965	1,693.039	563.672	282.905	785.214	277.724	11.736	2,539.616	1,074.674	3,614.290
1966	1,732.778	607.313	315.229	811.662	296.784	12.488	2,655.320	1,120.933	3,776.254
1967	1,753.242	665.562	348.298	828.161	307.951	13.243	2,767.102	1,149.355	3,916.457
1968	1,750.176	713.732	377.627	830.687	318.732	13.966	2,841.535	1,163.384	4,004.919
1969	1,786.929	768.345	410.230	835.625	324.309	14.682	2,965.504	1,174.616	4,140.120
1970	1,795.858	845.758	452.342	836.383	322.570	16.916	3,093.958	1,175.869	4,269.827
1971	1,836.481	903.055	493.302	851.389	337.373	20.000	3,232.838	1,208.762	4,441.600
1972	1,889.991	975.368	517.171	867.726	347.264	19.855	3,382.530	1,234.846	4,617.376
1973	1,907.390	1,063.916	561.135	886.143	366.393	22.707	3,532.441	1,275.243	4,807.684
1974	1,914.835	1,150.007	594.667	908.998	377.981	26.350	3,659.510	1,313.329	4,972.839
1975	1,979.345	1,210.937	648.566	931.483	388.371	26.931	3,838.848	1,346.785	5,185.632

1976	1,998.049	1,254.371	717.293	951.244	391.576	30.091	3,969.713	1,372.911	5,342.624
1977	2,041.447	1,311.252	769.079	963.247	394.141	30.106	4,121.778	1,387.494	5,509.272
1978	2,062.531	1,392.370	818.635	983.766	405.961	31.838	4,273.536	1,421.565	5,695.101
1979	2,085.380	1,418.910	861.681	993.418	402.084	34.164	4,365.971	1,429.665	5,795.636
1980	2,073.275	1,465.341	894.260	1,000.565	409.028	36.255	4,432.876	1,445.848	5,878.724
1981	2,034.122	1,458.847	944.643	994.285	407.821	37.625	4,437.612	1,439.731	5,877.343
1982	2,072.740	1,440.053	1,010.743	1,013.201	413.429	38.139	4,523.536	1,464.770	5,988.307
1983	2,088.524	1,413.073	1,072.406	1,020.673	422.980	43.275	4,574.003	1,486.928	6,060.931
1984	2,101.793	1,424.341	1,162.414	1,040.947	424.341	46.201	4,688.547	1,511.490	6,200.037
1985	2,110.136	1,405.917	1,198.570	1,048.322	427.492	47.202	4,714.623	1,523.016	6,237.640
1986	2,153.408	1,413.112	1,237.574	1,063.736	429.818	49.550	4,804.093	1,543.105	6,347.198
1987	2,184.430	1,429.705	1,293.649	1,078.376	431.405	52.148	4,907.785	1,561.929	6,469.714
1988	2,148.868	1,410.045	1,355.871	1,104.275	422.606	57.600	4,914.784	1,584.482	6,499.266
1989	2,061.321	1,407.634	1,388.101	1,123.873	411.973	61.523	4,857.056	1,597.369	6,454.425
1990	1,911.881	1,411.783	1,434.251	1,113.212	386.022	54.894	4,757.915	1,554.128	6,312.043
1991	1,777.139	1,332.482	1,425.464	1,059.335	351.305	55.413	4,535.085	1,466.053	6,001.138
1992	1,682.839	1,179.479	1,343.039	999.888	323.643	45.935	4,205.357	1,369.466	5,574.824
1993	1,556.524	986.361	1,307.812	987.297	303.566	34.157	3,850.697	1,325.021	5,175.718
1994	1,374.868	875.747	1,221.282	902.348	273.582	30.624	3,471.897	1,206.555	4,678.452
1995	1,326.179	813.115	1,192.551	863.411	259.869	31.153	3,331.844	1,154.434	4,486.278
1996	1,284.340	727.331	1,235.013	846.187	250.138	28.900	3,246.684	1,125.225	4,371.908
1997	1,222.300	728.835	1,144.093	812.535	247.513	32.698	3,095.228	1,092.746	4,187.974
1998	1,149.233	712.930	1,161.429	790.142	237.852	35.343	3,023.592	1,063.337	4,086.929
1999	1,098.851	689.928	1,174.692	796.000	230.334	36.551	2,963.471	1,062.886	4,026.357
2000	1,111.760	675.044	1,185.359	804.479	234.683	41.371	2,972.163	1,080.533	4,052.695
2001	1,110.382	687.251	1,205.610	806.654	237.893	40.629	3,003.243	1,085.176	4,088.419
2002	1,112.833	677.379	1,208.289	805.511	235.587	35.570	2,998.501	1,076.668	4,075.169
2003	1,132.038	694.046	1,236.033	830.164	233.006	32.127	3,062.117	1,095.298	4,157.414
2004	1,106.215	702.552	1,266.077	822.297	242.196	37.039	3,074.844	1,101.532	4,176.376
2005	1,080.114	712.999	1,288.160	821.782	242.267	40.261	3,081.272	1,104.310	4,185.582
2006	1,127.240	739.755	1,321.447	837.870	242.766	40.643	3,188.442	1,121.279	4,309.722
2007	1,134.108	742.729	1,329.585	834.818	243.704	41.684	3,206.421	1,120.205	4,326.627
2008	1,156.574	750.707	1,303.583	834.808	248.672	43.595	3,210.865	1,127.074	4,337.939
2009	1,051.644	719.109	1,218.887	762.403	237.809	37.720	2,989.641	1,037.932	4,027.573
2010	1,082.334	726.105	1,301.722	766.364	233.055	41.299	3,110.161	1,040.718	4,150.879
2011	1,134.640	762.527	1,337.352	777.588	245.133	40.468	3,234.520	1,063.189	4,297.709
2012	1,134.579	775.005	1,316.814	777.326	238.777	51.865	3,226.398	1,067.968	4,294.366
2013	1,095.050	753.912	1,287.211	769.060	243.480	56.270	3,136.173	1,068.811	4,204.984
2014	1,043.772	777.533	1,268.371	760.352	243.999	56.096	3,089.676	1,060.447	4,150.124
2015	1,015.897	767.527	1,232.748	751.709	243.369	55.240	3,016.172	1,050.318	4,066.489
2016	1,021.561	784.655	1,253.981	748.366	253.379	56.622	3,060.197	1,058.367	4,118.565
2017	981.263	804.068	1,279.589	741.352	254.758	66.924	3,064.921	1,063.034	4,127.954
2018	1,022.141	826.333	1,343.552	754.589	258.481	73.103	3,192.026	1,086.172	4,278.198
2019	967.154	834.490	1,326.682	759.382	260.212	68.724	3,128.326	1,088.318	4,216.644
2020	883.878	786.875	1,261.541	756.639	258.318	65.155	2,932.293	1,080.112	4,012.405

North America GHG emissions

Figure B.8 Total and per capita GHG emissions per source in North America 1820-2020 (Mtons and tons)

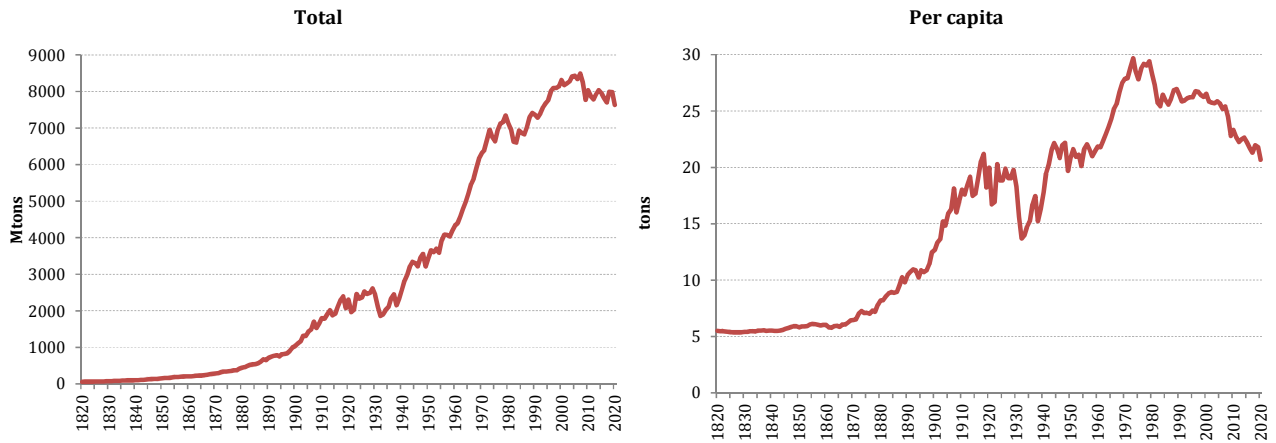


Table B.7 Total GHG emissions per source in North America 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	
1820	1.035			30.075	26.150		1.035	56.225	57.259
1821	1.082			30.925	26.823		1.082	57.748	58.830
1822	1.115			31.800	27.526		1.115	59.326	60.441
1823	1.152			32.925	28.200		1.152	61.125	62.276
1824	1.276			33.800	28.933		1.276	62.733	64.009
1825	1.404			34.925	29.636		1.404	64.561	65.965
1826	1.591			35.800	30.372		1.591	66.172	67.764
1827	1.736			36.900	31.224		1.736	68.124	69.860
1828	1.980			37.775	31.838		1.980	69.613	71.593
1829	2.191			38.900	32.452		2.191	71.352	73.543
1830	2.501			39.775	33.364		2.501	73.139	75.640
1831	2.683			41.200	34.279		2.683	75.479	78.162
1832	3.479			42.375	35.194		3.479	77.569	81.048
1833	4.010			43.775	36.109		4.010	79.884	83.894
1834	3.955			44.950	37.024		3.955	81.974	85.928
1835	4.967			46.375	38.236		4.967	84.611	89.579
1836	5.369			47.550	39.151		5.369	86.701	92.071
1837	5.967			48.975	40.066		5.967	89.041	95.009
1838	5.781			50.125	40.981		5.781	91.106	96.887
1839	6.294			51.550	41.896		6.294	93.446	99.740
1840	6.674			52.725	42.811		6.674	95.536	102.210
1841	7.120			54.475	44.030		7.120	98.505	105.625
1842	7.862			56.225	45.248		7.862	101.473	109.335
1843	8.756			57.975	46.762		8.756	104.737	113.493
1844	10.467			59.725	48.279		10.467	108.004	118.471
1845	12.469			61.725	50.094		12.469	111.819	124.287
1846	14.060			63.475	51.754		14.060	115.229	129.289
1847	16.638			65.225	53.616		16.638	118.841	135.479
1848	18.461			67.225	55.178		18.461	122.403	140.863
1849	20.089			68.950	56.742		20.089	125.692	145.781
1850	21.774			70.700	56.590	0.025	21.774	127.316	149.089
1851	26.965			72.675	57.514	0.025	26.965	130.214	157.179

1852	29.347			74.850	58.468	0.025	29.347	133.343	162.690
1853	32.974			77.175	59.421	0.025	32.974	136.622	169.596
1854	38.780			79.500	60.375	0.025	38.780	139.900	178.680
1855	41.658			82.100	61.299	0.025	41.658	143.424	185.082
1856	43.766			84.425	61.954	0.025	43.766	146.405	190.170
1857	44.916			86.525	62.878	0.025	44.916	149.428	194.345
1858	45.658			88.875	63.206	0.025	45.658	152.106	197.764
1859	49.636			91.250	63.832	0.025	49.636	155.107	204.743
1860	51.752	0.206		93.625	64.159	0.025	51.958	157.810	209.767
1861	49.254	0.304		94.325	64.159	0.025	49.558	158.510	208.067
1862	50.800	0.403		95.950	64.487	0.025	51.203	160.463	211.665
1863	58.914	0.501		98.050	64.785	0.025	59.415	162.861	222.276
1864	63.362	0.600		99.675	64.815	0.025	63.962	164.515	228.477
1865	63.388	0.699		101.275	65.113	0.025	64.086	166.413	230.500
1866	74.421	0.724		103.875	65.113	0.025	75.145	169.013	244.158
1867	77.305	0.750		105.250	65.441	0.025	78.055	170.716	248.771
1868	87.670	0.775		107.350	65.441	0.025	88.446	172.816	261.262
1869	98.644	0.801		109.975	65.769	0.025	99.445	175.769	275.214
1870	104.268	0.827		111.975	66.067	0.025	105.095	178.067	283.162
1871	109.311	0.826		114.075	67.020	0.025	110.137	181.121	291.258
1872	133.849	0.825		117.750	69.225	0.025	134.674	187.001	321.675
1873	147.162	0.824		120.425	72.354	0.025	147.987	192.805	340.791
1874	141.780	0.824		121.575	76.139	0.025	142.604	197.739	340.343
1875	144.125	0.823		123.250	80.520	0.025	144.948	203.795	348.743
1876	141.374	2.073		124.375	84.900	0.025	143.447	209.301	352.748
1877	155.257	3.322		127.275	88.983	0.025	158.579	216.283	374.862
1878	150.908	4.572		128.425	92.738	0.025	155.479	221.188	376.667
1879	182.420	5.821		133.075	95.569	0.025	188.242	228.669	416.911
1880	205.163	7.205		136.600	97.446	0.025	212.369	234.071	446.440
1881	216.634	6.381		139.000	98.400	0.025	223.015	237.425	460.440
1882	243.397	5.623	0.211	142.400	99.353	0.025	249.232	241.779	491.010
1883	267.598	4.799	0.484	145.300	100.277	0.025	272.880	245.602	518.482
1884	283.100	4.041	1.493	147.700	100.933	0.025	288.634	248.658	537.292
1885	285.734	3.217	4.731	149.300	101.558	0.025	293.682	250.884	544.566
1886	295.236	4.900	6.761	151.675	102.184	0.025	306.897	253.885	560.782
1887	339.784	6.584	8.790	154.325	102.810	0.025	355.157	257.160	612.318
1888	385.758	8.267	10.820	161.775	103.436	0.025	404.845	265.236	670.081
1889	367.293	9.951	12.849	159.075	104.091	0.025	390.093	263.192	653.285
1890	410.540	11.635	14.878	166.450	108.502	0.025	437.053	274.977	712.030
1891	439.274	11.805	13.608	169.850	109.187	0.029	464.688	279.066	743.754
1892	466.453	11.976	12.338	172.925	110.171	0.039	490.767	283.135	773.901
1893	474.957	12.146	11.069	174.300	111.124	0.055	498.171	285.479	783.650
1894	444.899	12.317	9.799	172.600	112.108	0.074	467.014	284.781	751.796
1895	500.769	12.487	8.529	178.650	113.091	0.096	521.785	291.837	813.621
1896	499.278	13.296	9.749	179.525	114.074	0.119	522.322	293.718	816.040
1897	521.101	14.172	10.969	182.100	115.058	0.143	546.241	297.301	843.542
1898	571.744	14.980	12.189	186.975	116.041	0.165	598.913	303.181	902.095
1899	660.688	15.789	13.409	195.175	117.323	0.185	689.887	312.683	1,002.569
1900	685.590	16.531	14.629	199.350	118.306	0.201	716.750	317.857	1,034.607
1901	749.619	18.008	16.248	206.500	119.289	0.215	783.875	326.004	1,109.880
1902	780.498	26.018	17.306	211.900	120.601	0.226	823.823	332.727	1,156.549
1903	918.435	32.033	18.365	225.400	121.882	0.237	968.832	347.519	1,316.351
1904	903.494	38.141	19.112	226.025	123.163	0.249	960.746	349.437	1,310.183
1905	1,007.557	43.677	21.539	237.275	124.475	0.260	1,072.774	362.009	1,434.783
1906	1,062.353	39.738	23.781	243.650	125.756	0.270	1,125.872	369.676	1,495.547
1907	1,230.866	55.831	25.026	261.350	127.037	0.281	1,311.723	388.668	1,700.391
1908	1,069.800	58.577	24.714	249.575	128.349	0.292	1,153.092	378.216	1,531.307
1909	1,180.527	60.321	29.570	261.600	129.332	0.304	1,270.418	391.236	1,661.655
1910	1,287.647	72.077	31.251	274.250	130.613	0.319	1,390.975	405.183	1,796.158
1911	1,269.074	74.654	32.213	275.000	131.895	0.334	1,375.942	407.229	1,783.171
1912	1,372.510	76.475	35.359	283.125	133.474	0.350	1,484.343	416.950	1,901.293
1913	1,461.790	87.868	37.182	294.000	135.352	0.368	1,586.840	429.719	2,016.559

1914	1,320.012	95.939	37.860	284.100	137.229	0.385	1,453.811	421.714	1,875.525
1915	1,350.964	102.688	40.178	291.525	139.106	0.405	1,493.830	431.036	1,924.866
1916	1,505.815	108.988	48.226	307.150	140.984	0.425	1,663.029	448.559	2,111.588
1917	1,657.289	127.642	50.826	322.500	142.861	0.446	1,835.758	465.807	2,301.565
1918	1,735.191	139.837	45.843	330.500	144.470	0.468	1,920.871	475.439	2,396.310
1919	1,412.883	158.736	47.150	307.750	145.454	0.491	1,618.768	453.695	2,072.463
1920	1,588.443	193.043	48.100	330.750	146.139	0.515	1,829.586	477.404	2,306.990
1921	1,277.131	196.705	39.642	306.000	146.527	0.766	1,513.479	453.293	1,966.771
1922	1,292.084	225.980	45.551	308.500	146.020	1.409	1,563.615	455.929	2,019.544
1923	1,625.265	277.347	59.680	351.750	145.543	2.353	1,962.291	499.646	2,461.938
1924	1,504.363	277.793	67.394	334.000	144.739	3.510	1,849.549	482.249	2,331.798
1925	1,499.802	308.029	69.985	341.750	143.964	4.793	1,877.816	490.507	2,368.323
1926	1,625.435	322.055	77.073	357.250	143.159	6.112	2,024.562	506.521	2,531.083
1927	1,542.937	329.188	84.607	353.000	142.355	7.370	1,956.731	502.725	2,459.456
1928	1,535.263	358.913	91.664	353.500	141.550	8.490	1,985.840	503.540	2,489.380
1929	1,584.939	400.835	112.074	366.500	141.341	9.370	2,097.848	517.211	2,615.059
1930	1,406.630	427.795	113.683	349.250	141.133	9.930	1,948.108	500.313	2,448.421
1931	1,152.550	377.150	98.806	326.250	141.490	10.180	1,628.506	477.920	2,106.427
1932	963.644	345.508	91.481	308.500	142.176	10.210	1,400.634	460.886	1,861.520
1933	987.464	363.438	91.639	316.250	143.159	10.080	1,442.541	469.489	1,912.030
1934	1,077.421	364.689	104.086	326.750	144.143	9.850	1,546.196	480.743	2,026.938
1935	1,096.211	414.482	112.684	332.000	145.424	9.560	1,623.377	486.984	2,110.361
1936	1,239.642	458.776	127.535	352.750	146.705	9.270	1,825.953	508.725	2,334.678
1937	1,295.334	498.338	141.917	360.750	148.285	9.040	1,935.589	518.075	2,453.664
1938	1,034.003	488.623	135.135	338.250	149.566	8.890	1,657.762	496.706	2,154.468
1939	1,154.811	517.936	145.390	354.250	150.877	8.910	1,818.137	514.037	2,332.174
1940	1,302.904	567.117	156.869	372.750	152.457	9.130	2,026.891	534.337	2,561.227
1941	1,476.668	627.523	163.847	394.000	156.867	9.570	2,268.039	560.437	2,828.476
1942	1,620.108	588.994	178.105	415.000	166.880	10.210	2,387.207	592.090	2,979.297
1943	1,763.078	630.895	199.382	428.750	180.946	10.990	2,593.356	620.686	3,214.041
1944	1,757.789	708.970	215.734	452.500	197.544	11.930	2,682.493	661.974	3,344.467
1945	1,653.839	743.517	227.386	450.951	216.206	13.023	2,624.742	680.180	3,304.922
1946	1,514.370	768.094	233.757	449.950	234.999	14.084	2,516.222	699.033	3,215.255
1947	1,618.780	833.059	257.495	478.979	252.539	15.245	2,709.334	746.763	3,456.097
1948	1,564.773	922.135	287.692	495.996	267.603	16.517	2,774.600	780.115	3,554.715
1949	1,264.644	880.214	301.987	471.721	279.237	17.688	2,446.844	768.646	3,215.490
1950	1,311.896	986.709	350.257	509.259	285.561	18.859	2,648.862	813.678	3,462.541
1951	1,330.084	1,074.439	413.640	526.276	289.737	20.040	2,818.162	836.053	3,654.215
1952	1,201.785	1,115.934	442.852	530.280	294.838	21.331	2,760.571	846.449	3,607.020
1953	1,200.849	1,164.997	464.262	547.047	300.595	22.733	2,830.108	870.374	3,700.482
1954	1,027.570	1,190.762	490.133	549.049	306.978	24.144	2,708.465	880.171	3,588.636
1955	1,168.871	1,302.305	530.708	583.833	314.317	25.666	3,001.884	923.815	3,925.699
1956	1,193.911	1,363.941	567.902	609.109	320.760	27.197	3,125.754	957.066	4,082.820
1957	1,131.454	1,364.470	604.963	620.620	330.216	28.829	3,100.887	979.665	4,080.551
1958	990.790	1,406.665	635.646	629.879	339.702	30.470	3,033.101	1,000.051	4,033.152
1959	985.648	1,474.185	700.108	651.651	346.175	32.222	3,159.941	1,030.048	4,189.989
1960	1,014.792	1,518.961	744.487	674.174	355.631	33.874	3,278.240	1,063.678	4,341.918
1961	989.593	1,545.370	773.431	681.681	374.036	35.746	3,308.394	1,091.463	4,399.856
1962	1,017.693	1,606.701	823.964	708.458	393.216	37.838	3,448.357	1,139.512	4,587.869
1963	1,068.965	1,660.847	866.022	734.484	415.141	39.960	3,595.834	1,189.585	4,785.419
1964	1,127.918	1,704.820	919.439	760.260	430.712	42.292	3,752.178	1,233.264	4,985.442
1965	1,192.674	1,776.242	952.916	782.782	455.799	44.725	3,921.832	1,283.306	5,205.138
1966	1,246.205	1,867.175	1,029.077	805.305	474.711	47.167	4,142.457	1,327.183	5,469.640
1967	1,222.784	1,933.640	1,086.587	830.330	495.891	49.710	4,243.012	1,375.930	5,618.941
1968	1,265.012	2,064.189	1,166.557	857.857	511.134	52.242	4,495.758	1,421.233	5,916.991
1969	1,270.053	2,164.566	1,257.771	888.388	523.573	54.755	4,692.390	1,466.715	6,159.105
1970	1,269.551	2,258.595	1,329.812	880.880	514.385	59.830	4,857.959	1,455.095	6,313.053
1971	1,199.202	2,347.334	1,371.705	893.643	527.838	61.181	4,918.241	1,482.662	6,400.904
1972	1,252.126	2,531.352	1,395.042	910.159	537.831	62.322	5,178.520	1,510.313	6,688.833
1973	1,328.379	2,685.959	1,391.580	919.919	558.116	68.719	5,405.918	1,546.753	6,952.672
1974	1,294.016	2,560.147	1,348.843	919.168	556.027	73.223	5,203.006	1,548.419	6,751.425
1975	1,310.055	2,540.806	1,247.757	915.415	564.976	65.295	5,098.618	1,545.686	6,644.304

1976	1,398.222	2,716.645	1,271.186	905.905	581.085	70.120	5,386.053	1,557.110	6,943.162
1977	1,432.221	2,886.892	1,248.563	892.892	579.891	77.067	5,567.676	1,549.850	7,117.526
1978	1,415.330	2,944.363	1,254.043	886.386	581.979	81.882	5,613.736	1,550.247	7,163.982
1979	1,554.051	2,906.405	1,294.099	906.155	595.403	84.745	5,754.555	1,586.303	7,340.858
1980	1,591.985	2,693.135	1,267.504	915.665	587.050	79.680	5,552.624	1,582.395	7,135.019
1981	1,643.669	2,509.417	1,239.372	912.662	584.664	79.580	5,392.458	1,576.905	6,969.363
1982	1,594.494	2,355.239	1,160.383	903.653	542.604	73.173	5,110.115	1,519.430	6,629.545
1983	1,650.881	2,329.952	1,134.732	873.373	539.621	78.078	5,115.565	1,491.072	6,606.636
1984	1,785.063	2,404.181	1,209.363	885.635	565.275	84.785	5,398.608	1,535.694	6,934.302
1985	1,820.501	2,386.922	1,148.424	878.378	550.062	82.783	5,355.847	1,511.222	6,867.069
1986	1,789.049	2,474.380	1,082.309	866.115	530.374	83.584	5,345.738	1,480.073	6,825.811
1987	1,871.705	2,533.393	1,143.524	864.113	523.811	87.187	5,548.622	1,475.112	7,023.733
1988	1,971.492	2,635.194	1,203.363	874.874	519.933	98.498	5,810.049	1,493.306	7,303.355
1989	1,983.274	2,641.094	1,282.469	876.876	528.286	102.002	5,906.837	1,507.164	7,414.001
1990	1,992.546	2,599.176	1,278.105	871.621	521.723	98.298	5,869.826	1,491.642	7,361.468
1991	1,971.156	2,534.893	1,302.854	879.629	508.001	91.391	5,808.903	1,479.022	7,287.924
1992	1,987.664	2,578.052	1,355.333	882.382	508.896	93.383	5,921.049	1,484.661	7,405.710
1993	2,050.646	2,605.476	1,397.949	876.125	538.428	93.103	6,054.071	1,507.656	7,561.727
1994	2,060.828	2,669.864	1,432.543	888.137	526.496	96.216	6,163.236	1,510.849	7,674.085
1995	2,079.009	2,655.677	1,495.618	883.383	539.024	111.391	6,230.303	1,533.798	7,764.101
1996	2,174.966	2,755.198	1,530.632	880.129	553.044	119.309	6,460.796	1,552.483	8,013.279
1997	2,225.959	2,802.102	1,536.822	866.866	540.218	125.535	6,564.883	1,532.619	8,097.502
1998	2,223.213	2,844.916	1,504.510	852.602	536.340	139.629	6,572.638	1,528.571	8,101.209
1999	2,215.529	2,920.889	1,506.946	833.333	525.303	137.207	6,643.364	1,495.842	8,139.206
2000	2,315.158	2,962.361	1,557.511	829.078	509.791	138.919	6,835.030	1,477.788	8,312.818
2001	2,255.094	2,960.887	1,486.305	820.570	523.513	128.088	6,702.286	1,472.171	8,174.457
2002	2,254.850	2,965.648	1,538.633	810.810	520.232	134.464	6,759.132	1,465.506	8,224.638
2003	2,295.162	3,025.584	1,501.031	809.809	525.004	126.426	6,821.778	1,461.240	8,283.018
2004	2,301.849	3,139.380	1,501.695	805.054	536.042	131.682	6,942.923	1,472.777	8,415.701
2005	2,334.202	3,161.376	1,482.647	803.803	519.933	132.452	6,978.226	1,456.189	8,434.414
2006	2,296.780	3,132.926	1,461.507	805.054	514.564	135.075	6,891.213	1,454.693	8,345.906
2007	2,330.530	3,128.287	1,558.615	808.057	524.408	143.463	7,017.433	1,475.928	8,493.361
2008	2,291.659	2,939.936	1,565.941	811.060	507.703	144.434	6,797.537	1,463.198	8,260.734
2009	2,006.789	2,799.627	1,532.247	794.544	501.141	140.771	6,338.663	1,436.455	7,775.118
2010	2,120.837	2,854.664	1,607.720	794.794	509.493	148.088	6,583.221	1,452.375	8,035.596
2011	1,997.217	2,803.404	1,647.769	769.018	500.842	154.675	6,448.389	1,424.535	7,872.924
2012	1,772.487	2,921.357	1,710.952	760.760	472.206	151.251	6,404.796	1,384.217	7,789.013
2013	1,746.995	2,991.693	1,764.668	759.259	521.723	151.051	6,503.356	1,432.033	7,935.389
2014	1,739.632	3,048.971	1,806.903	758.258	532.462	154.354	6,595.505	1,445.074	8,040.579
2015	1,516.422	3,136.727	1,857.719	757.023	528.152	155.667	6,510.869	1,440.842	7,951.711
2016	1,390.170	3,158.905	1,863.593	744.145	511.570	153.698	6,412.668	1,409.412	7,822.081
2017	1,348.733	3,106.733	1,840.859	747.729	502.506	154.041	6,296.324	1,404.276	7,700.600
2018	1,283.621	3,430.302	1,853.375	756.071	518.993	153.964	6,567.298	1,429.028	7,996.326
2019	1,103.852	3,540.389	1,911.667	758.010	516.015	158.054	6,555.908	1,432.079	7,987.987
2020	894.810	3,444.060	1,869.319	758.065	509.716	157.221	6,208.189	1,425.001	7,633.190

Latin America GHG emissions

Figure B.9 Total and per capita GHG emissions per source in Latin America 1820-2020 (Mtons and tons)



Table B.8 Total GHG emissions per source in Latin America 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	
1820				28.945	3.095			32.041	32.041
1821				29.499	3.146			32.645	32.645
1822				30.060	3.202			33.262	33.262
1823				30.608	3.249			33.857	33.857
1824				31.195	3.306			34.501	34.501
1825				31.774	3.356			35.131	35.131
1826				32.349	3.414			35.762	35.762
1827				32.880	3.467			36.346	36.346
1828				33.465	3.519			36.985	36.985
1829				34.018	3.573			37.591	37.591
1830				34.621	3.624			38.245	38.245
1831				35.185	3.684			38.869	38.869
1832				35.759	3.738			39.498	39.498
1833				36.269	3.796			40.065	40.065
1834				36.864	3.849			40.713	40.713
1835				37.416	3.906			41.322	41.322
1836				37.988	3.964			41.952	41.952
1837				38.584	4.019			42.603	42.603
1838				39.132	4.073			43.204	43.204
1839				39.684	4.131			43.815	43.815
1840				40.290	4.191			44.481	44.481
1841	0.044			40.926	4.253		0.044	45.178	45.222
1842	0.142			41.567	4.317		0.142	45.884	46.026
1843	0.022			42.264	4.379		0.022	46.643	46.665
1844	0.018			42.903	4.443		0.018	47.346	47.364
1845	0.023			43.608	4.509		0.023	48.117	48.141
1846	0.026			44.230	4.569		0.026	48.800	48.826
1847	0.068			44.881	4.636		0.068	49.516	49.584
1848	0.090			45.580	4.701		0.090	50.280	50.371
1849	0.128			46.212	4.768		0.128	50.980	51.108
1850	0.172			46.921	4.939	0.000	0.172	51.860	52.032
1851	0.242			47.668	5.020	0.000	0.242	52.688	52.929
1852	0.195			48.378	5.095	0.000	0.195	53.474	53.669

1853	0.233		49.112	5.163	0.000	0.233	54.276	54.509
1854	0.213		49.838	5.231	0.000	0.213	55.069	55.282
1855	0.284		50.580	5.302	0.000	0.284	55.882	56.166
1856	1.032		51.270	5.361	0.000	1.032	56.631	57.663
1857	1.358		52.020	5.418	0.000	1.358	57.439	58.797
1858	1.432		52.747	5.468	0.000	1.432	58.215	59.647
1859	1.179		53.473	5.510	0.000	1.179	58.984	60.163
1860	1.453		54.174	5.541	0.000	1.453	59.716	61.169
1861	1.527		54.892	5.555	0.000	1.527	60.447	61.975
1862	1.634		55.583	5.582	0.000	1.634	61.165	62.799
1863	1.474		56.304	5.614	0.000	1.474	61.918	63.391
1864	1.957		56.959	5.640	0.000	1.957	62.599	64.557
1865	2.167		57.651	5.669	0.000	2.167	63.321	65.488
1866	2.734		58.341	5.698	0.000	2.734	64.039	66.773
1867	2.886		58.996	5.724	0.000	2.886	64.721	67.607
1868	3.200		59.691	5.756	0.000	3.200	65.447	68.647
1869	3.021		60.370	5.786	0.000	3.021	66.156	69.177
1870	3.030		61.066	5.819	0.000	3.030	66.886	69.916
1871	3.139		62.000	5.888	0.000	3.139	67.889	71.028
1872	3.982		62.911	6.026	0.000	3.982	68.938	72.920
1873	4.336		63.821	6.218	0.000	4.336	70.040	74.376
1874	4.819		64.677	6.448	0.000	4.819	71.126	75.944
1875	4.279		65.639	6.689	0.000	4.279	72.328	76.607
1876	4.136		66.557	6.947	0.000	4.136	73.505	77.641
1877	3.946		67.470	7.191	0.000	3.946	74.662	78.608
1878	3.998		68.391	7.405	0.000	3.998	75.796	79.794
1879	4.137		69.329	7.575	0.000	4.137	76.904	81.041
1880	4.501	0.003	70.231	7.695	0.000	4.504	77.927	82.431
1881	4.807	0.003	71.820	7.769	0.000	4.810	79.589	84.399
1882	4.923	0.015	73.393	7.844	0.000	4.938	81.237	86.175
1883	5.176	0.015	75.012	7.903	0.000	5.191	82.915	88.106
1884	5.757	0.018	76.587	7.957	0.000	5.775	84.544	90.319
1885	5.987	0.022	78.164	8.011	0.000	6.009	86.175	92.185
1886	5.648	0.020	79.814	8.062	0.000	5.668	87.876	93.544
1887	6.593	0.024	81.361	8.112	0.000	6.617	89.473	96.090
1888	7.977	0.019	82.982	8.166	0.000	7.996	91.148	99.144
1889	9.398	0.033	84.514	8.231	0.000	9.431	92.746	102.177
1890	8.258	0.058	86.145	10.207	0.000	8.317	96.352	104.669
1891	9.371	0.084	87.881	10.321	0.000	9.455	98.202	107.657
1892	10.188	0.062	89.563	10.534	0.000	10.250	100.097	110.348
1893	9.912	0.057	91.197	10.835	0.001	9.968	102.033	112.001
1894	12.000	0.057	92.904	11.230	0.001	12.058	104.135	116.192
1895	12.044	0.061	94.708	11.667	0.001	12.104	106.376	118.480
1896	12.725	0.060	96.368	12.135	0.001	12.784	108.504	121.289
1897	12.674	0.080	98.070	12.679	0.001	12.754	110.751	123.505
1898	13.735	0.105	99.832	13.248	0.002	13.840	113.082	126.921
1899	14.998	0.133	101.447	13.863	0.002	15.132	115.312	130.444
1900	14.476	0.142	103.311	14.452	0.002	14.617	117.765	132.383
1901	16.076	0.122	106.250	15.313	0.002	16.199	121.565	137.764
1902	17.163	0.136	108.960	16.541	0.002	17.299	125.503	142.802
1903	18.492	0.329	111.585	18.022	0.002	18.821	129.609	148.430
1904	19.498	0.354	114.065	19.710	0.003	19.852	133.777	153.629
1905	22.101	0.464	116.539	21.437	0.003	22.565	137.978	160.543
1906	25.560	0.636	119.162	23.139	0.003	26.196	142.304	168.500
1907	28.402	0.898	121.862	24.760	0.003	29.300	146.625	175.925
1908	27.973	2.235	124.824	26.118	0.003	30.208	150.945	181.153
1909	28.119	1.750	127.422	27.137	0.003	29.870	154.562	184.432
1910	30.865	2.196	130.063	27.765	0.003	33.061	157.831	190.892
1911	34.434	5.829	134.553	28.113	0.003	40.263	162.670	202.933
1912	34.235	4.266	138.307	28.521	0.004	38.501	166.831	205.332
1913	34.212	2.610	141.397	28.824	0.004	36.822	170.224	207.047
1914	29.437	2.207	147.569	29.120	0.004	31.644	176.692	208.336

1915	21.653	4.612		153.628	29.380	0.004	26.265	183.012	209.277
1916	20.281	7.577		159.747	29.660	0.004	27.858	189.411	217.269
1917	19.157	6.119		166.050	29.896	0.005	25.275	195.950	221.225
1918	18.571	7.337		172.097	30.053	0.005	25.908	202.154	228.062
1919	18.625	6.816		178.219	30.191	0.005	25.441	208.415	233.857
1920	22.372	8.706		183.975	30.301	0.005	31.078	214.281	245.359
1921	18.286	9.647		190.988	30.352	0.012	27.933	221.352	249.284
1922	19.279	7.771	0.127	197.901	30.222	0.028	27.176	228.151	255.327
1923	22.758	7.637	0.192	204.893	30.056	0.053	30.588	235.003	265.590
1924	26.031	8.485	0.258	212.337	29.775	0.083	34.774	242.196	276.970
1925	24.851	15.452	1.194	219.351	29.514	0.116	41.498	248.981	290.478
1926	23.951	19.696	1.333	226.439	29.225	0.150	44.980	255.813	300.793
1927	26.503	20.180	1.478	233.072	29.011	0.181	48.160	262.264	310.424
1928	24.573	24.413	1.630	239.990	28.817	0.207	50.615	269.014	319.629
1929	24.972	24.288	1.789	247.296	28.678	0.226	51.049	276.200	327.249
1930	24.687	20.486	1.945	253.042	28.720	0.236	47.118	281.997	329.115
1931	20.221	17.656	2.111	257.840	28.917	0.235	39.988	286.992	326.980
1932	18.457	14.874	3.306	272.485	29.396	0.228	36.638	302.109	338.746
1933	20.888	15.918	3.536	278.944	30.064	0.214	40.342	309.222	349.563
1934	21.854	17.293	3.846	285.209	30.950	0.197	42.993	316.356	359.349
1935	23.456	19.485	4.688	293.015	31.907	0.178	47.628	325.100	372.728
1936	24.910	22.928	4.905	298.579	32.921	0.159	52.744	331.659	384.402
1937	26.722	30.333	4.789	304.580	34.053	0.142	61.844	338.775	400.619
1938	25.985	31.985	6.205	312.569	35.162	0.128	64.175	347.859	412.034
1939	23.093	33.890	7.402	304.262	36.256	0.120	64.384	340.638	405.022
1940	22.419	35.890	7.613	308.610	37.299	0.119	65.922	346.027	411.949
1941	19.736	35.418	6.950	325.992	39.320	0.123	62.104	365.435	427.540
1942	17.748	33.668	6.401	332.293	43.237	0.129	57.817	375.658	433.476
1943	18.698	33.348	5.844	339.258	48.522	0.136	57.890	387.915	445.805
1944	18.544	36.610	6.699	352.461	54.910	0.144	61.853	407.515	469.368
1945	18.843	39.239	7.036	359.962	62.157	0.154	65.118	422.273	487.391
1946	20.595	50.611	7.363	369.032	69.679	0.165	78.568	438.876	517.445
1947	23.004	58.773	8.576	379.938	76.861	0.177	90.353	456.976	547.329
1948	24.094	66.505	8.204	385.592	83.527	0.189	98.803	469.308	568.111
1949	22.529	71.279	8.924	388.099	88.893	0.202	102.733	477.194	579.927
1950	24.147	89.999	10.853	394.209	92.562	0.215	124.999	486.986	611.985
1951	24.478	103.107	10.430	403.127	96.192	0.228	138.015	499.547	637.561
1952	24.580	107.319	10.888	411.463	101.658	0.242	142.787	513.363	656.150
1953	24.195	107.458	11.940	413.944	108.285	0.259	143.593	522.487	666.080
1954	24.783	112.493	12.806	421.398	115.988	0.276	150.083	537.663	687.746
1955	26.264	124.367	14.464	460.637	124.308	0.294	165.095	585.239	750.335
1956	28.403	146.962	15.278	464.127	132.618	0.315	190.642	597.059	787.702
1957	27.572	177.788	18.778	471.377	140.821	0.335	224.137	612.532	836.670
1958	27.714	177.381	23.554	424.472	148.483	0.358	228.649	573.313	801.962
1959	27.805	191.413	26.989	480.422	155.066	0.380	246.207	635.869	882.076
1960	29.817	195.608	29.326	464.023	160.663	0.404	254.751	625.090	879.841
1961	30.029	205.563	33.845	455.705	166.415	0.432	269.437	622.552	891.989
1962	30.604	218.966	37.300	447.318	169.653	0.463	286.870	617.434	904.304
1963	31.593	219.111	40.796	458.949	172.517	0.497	291.500	631.963	923.463
1964	32.453	228.344	44.357	460.889	178.117	0.536	305.154	639.542	944.696
1965	32.332	231.760	47.919	472.164	184.407	0.578	312.010	657.150	969.160
1966	34.675	252.890	49.018	470.352	190.144	0.622	336.584	661.118	997.702
1967	36.680	262.609	48.548	477.949	196.269	0.666	347.837	674.884	1,022.721
1968	36.678	284.819	51.484	476.766	200.967	0.712	372.980	678.445	1,051.425
1969	39.239	298.931	56.044	472.674	203.989	0.758	394.214	677.420	1,071.634
1970	39.061	311.610	56.728	484.399	208.584	0.972	407.398	693.955	1,101.353
1971	38.128	329.871	58.248	485.587	205.948	1.055	426.246	692.589	1,118.835
1972	38.308	358.711	62.304	501.806	216.440	1.133	459.323	719.380	1,178.703
1973	40.625	388.799	70.589	513.407	218.130	1.406	500.013	732.943	1,232.956
1974	45.377	413.373	74.714	528.752	231.696	1.597	533.464	762.045	1,295.508
1975	47.314	424.428	75.106	541.866	242.405	1.643	546.849	785.914	1,332.763
1976	48.124	452.302	82.356	566.304	254.234	1.933	582.782	822.471	1,405.253

1977	56.125	475.724	88.110	576.513	253.021	2.231	619.959	831.766	1,451.724
1978	53.513	516.872	96.608	579.223	257.310	2.554	666.993	839.088	1,506.080
1979	55.675	551.139	107.525	590.645	262.480	3.422	714.339	856.547	1,570.886
1980	59.523	578.385	113.523	614.294	271.230	4.302	751.431	889.826	1,641.257
1981	60.011	582.434	119.394	621.604	271.012	4.437	761.838	897.053	1,658.892
1982	59.747	582.128	129.581	628.673	272.050	4.270	771.456	904.993	1,676.449
1983	65.682	562.239	134.157	629.945	268.479	5.132	762.079	903.556	1,665.635
1984	74.585	567.984	140.861	638.238	268.326	5.478	783.430	912.042	1,695.472
1985	84.138	579.696	143.545	643.521	273.781	6.078	807.379	923.380	1,730.759
1986	84.670	612.513	144.956	652.010	284.475	6.712	842.140	943.197	1,785.336
1987	91.166	628.047	145.496	664.215	289.499	7.163	864.708	960.877	1,825.586
1988	90.149	645.489	154.118	674.888	287.795	7.693	889.756	970.376	1,860.132
1989	95.631	654.109	157.306	689.900	281.722	8.417	907.046	980.039	1,887.085
1990	78.420	708.951	165.286	688.945	282.159	8.816	952.657	979.920	1,932.577
1991	81.065	688.199	169.041	702.472	285.758	9.164	938.306	997.394	1,935.700
1992	84.365	719.435	173.205	716.014	288.710	9.022	977.006	1,013.746	1,990.751
1993	86.674	722.686	181.506	725.865	291.155	8.908	990.866	1,025.928	2,016.794
1994	88.723	777.074	190.323	741.844	296.052	7.905	1,056.120	1,045.801	2,101.921
1995	92.022	786.405	205.223	754.016	299.664	11.851	1,083.649	1,065.531	2,149.180
1996	96.648	801.969	220.900	752.028	294.984	21.353	1,119.517	1,068.365	2,187.882
1997	103.307	850.891	225.450	765.078	298.920	30.229	1,179.648	1,094.227	2,273.875
1998	102.231	888.138	239.905	772.851	307.143	33.175	1,230.273	1,113.168	2,343.441
1999	100.359	895.847	236.623	778.432	306.256	32.763	1,232.830	1,117.451	2,350.281
2000	104.045	918.319	251.320	796.372	311.411	28.695	1,273.684	1,136.478	2,410.162
2001	106.007	912.057	257.212	816.009	322.173	21.921	1,275.276	1,160.103	2,435.379
2002	122.541	900.888	267.835	833.433	326.556	17.698	1,291.265	1,177.687	2,468.951
2003	113.474	892.929	284.011	860.113	341.039	21.255	1,290.414	1,222.407	2,512.821
2004	118.791	924.080	313.744	879.919	346.955	31.339	1,356.614	1,258.213	2,614.827
2005	123.827	951.624	330.777	901.825	356.136	36.841	1,406.228	1,294.801	2,701.030
2006	139.667	971.205	358.363	909.111	361.833	41.606	1,469.235	1,312.551	2,781.786
2007	141.588	1,030.659	362.667	899.627	366.538	45.868	1,534.914	1,312.033	2,846.947
2008	143.916	1,061.996	371.789	909.897	362.349	49.774	1,577.702	1,322.020	2,899.722
2009	128.050	1,049.460	370.625	923.179	359.790	52.121	1,548.135	1,335.091	2,883.226
2010	157.107	1,095.089	391.863	928.369	370.418	56.284	1,644.059	1,355.072	2,999.131
2011	170.924	1,116.738	409.131	941.649	379.559	57.659	1,696.793	1,378.867	3,075.659
2012	170.048	1,167.571	436.985	943.199	382.255	60.546	1,774.604	1,386.000	3,160.604
2013	180.499	1,191.092	453.739	957.349	384.703	65.263	1,825.330	1,407.315	3,232.644
2014	186.751	1,182.023	465.996	965.807	385.940	71.083	1,834.771	1,422.830	3,257.601
2015	186.332	1,178.797	486.649	985.197	380.608	74.002	1,851.778	1,439.807	3,291.586
2016	182.061	1,141.562	490.893	999.134	395.133	79.696	1,814.516	1,473.963	3,288.479
2017	193.607	1,130.213	499.102	1,001.927	408.081	81.788	1,822.922	1,491.796	3,314.718
2018	184.112	1,107.990	488.636	992.422	401.049	85.761	1,780.737	1,479.232	3,259.969
2019	178.714	1,078.265	476.045	1,020.663	410.470	89.172	1,733.024	1,520.306	3,253.330
2020	145.043	948.016	440.911	1,001.416	401.187	86.739	1,533.970	1,489.343	3,023.312

Oceania GHG emissions

Figure B.10 Total and per capita GHG emissions per source in Oceania 1820-2020 (Mtons and tons)

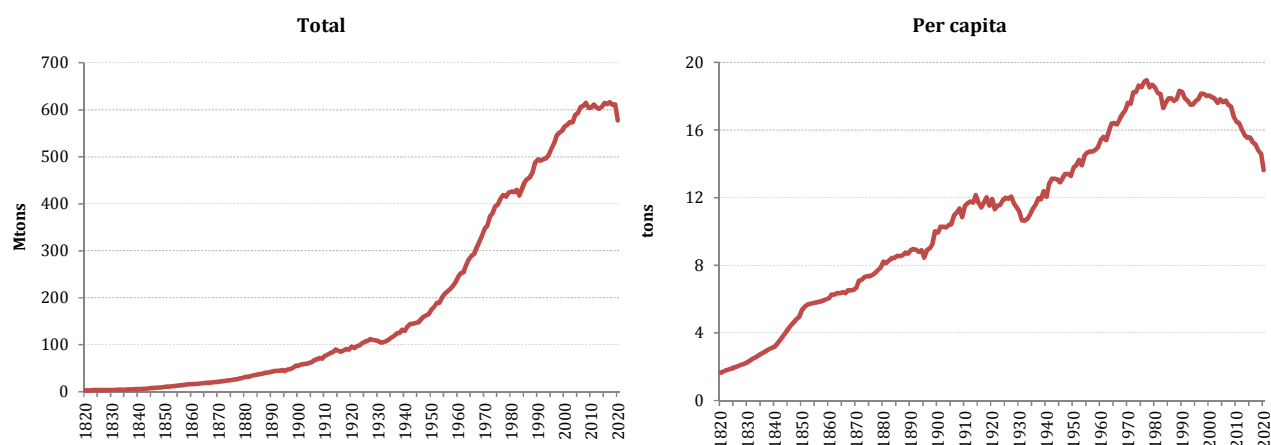


Table B.9 Total GHG emissions per source in Oceania 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	
1820				2.179	0.504			2.683	2.683
1821				2.244	0.532			2.776	2.776
1822				2.313	0.563			2.875	2.875
1823				2.378	0.591			2.969	2.969
1824				2.444	0.621			3.065	3.065
1825				2.508	0.649			3.157	3.157
1826				2.575	0.680			3.255	3.255
1827				2.642	0.708			3.350	3.350
1828				2.709	0.735			3.444	3.444
1829				2.773	0.766			3.540	3.540
1830	0.064			2.840	0.794		0.064	3.634	3.698
1831	0.070			2.948	0.849		0.070	3.798	3.868
1832	0.077			3.054	0.905		0.077	3.959	4.036
1833	0.084			3.162	0.960		0.084	4.122	4.207
1834	0.093			3.270	1.016		0.093	4.286	4.378
1835	0.102			3.373	1.071		0.102	4.444	4.546
1836	0.111			3.492	1.126		0.111	4.618	4.729
1837	0.122			3.587	1.182		0.122	4.769	4.891
1838	0.134			3.705	1.237		0.134	4.942	5.077
1839	0.147			3.798	1.292		0.147	5.091	5.238
1840	0.161			3.917	1.348		0.161	5.264	5.426
1841	0.177			4.179	1.508		0.177	5.687	5.864
1842	0.194			4.414	1.667		0.194	6.081	6.275
1843	0.213			4.674	1.824		0.213	6.498	6.711
1844	0.234			4.934	1.984		0.234	6.918	7.151
1845	0.256			5.194	2.144		0.256	7.337	7.594
1846	0.281			5.454	2.303		0.281	7.757	8.038
1847	0.308			5.691	2.463		0.308	8.154	8.462
1848	0.338			5.948	2.620		0.338	8.568	8.906
1849	0.371			6.206	2.780		0.371	8.985	9.356

1850	0.407		6.463	3.450	0.001	0.407	9.914	10.321
1851	0.366		6.978	3.514	0.001	0.366	10.494	10.860
1852	0.420		7.493	3.579	0.001	0.420	11.073	11.494
1853	0.393		8.008	3.643	0.001	0.393	11.653	12.045
1854	0.422		8.523	3.699	0.001	0.422	12.223	12.645
1855	0.474		9.038	3.754	0.001	0.474	12.793	13.267
1856	0.473		9.553	3.803	0.001	0.473	13.357	13.830
1857	0.505		10.094	3.843	0.001	0.505	13.938	14.443
1858	0.533		10.609	3.880	0.001	0.533	14.490	15.023
1859	0.443		11.098	3.907	0.001	0.443	15.007	15.450
1860	0.364		11.613	3.926	0.001	0.364	15.540	15.905
1861	0.539		12.128	3.935	0.001	0.539	16.064	16.603
1862	0.362		12.566	3.944	0.001	0.362	16.511	16.873
1863	0.512		13.055	3.947	0.001	0.512	17.004	17.516
1864	0.432		13.519	3.947	0.001	0.432	17.467	17.899
1865	0.548		14.034	3.978	0.001	0.548	18.013	18.561
1866	0.234		14.575	3.978	0.001	0.234	18.554	18.787
1867	0.570		15.090	3.978	0.001	0.570	19.069	19.639
1868	0.515		15.527	3.981	0.001	0.515	19.509	20.025
1869	0.551		15.991	4.012	0.001	0.551	20.004	20.555
1870	0.782		16.454	4.015	0.001	0.782	20.470	21.252
1871	0.901		16.918	4.088	0.001	0.901	21.007	21.909
1872	0.918		17.381	4.220	0.001	0.918	21.603	22.521
1873	1.132		17.871	4.426	0.001	1.132	22.298	23.430
1874	1.160		18.334	4.708	0.001	1.160	23.044	24.204
1875	1.076		18.772	4.966	0.001	1.076	23.739	24.816
1876	1.210		19.261	5.258	0.001	1.210	24.520	25.730
1877	1.347		19.750	5.543	0.001	1.347	25.295	26.641
1878	1.839		20.214	5.792	0.001	1.839	26.007	27.846
1879	2.364		20.806	5.995	0.001	2.364	26.802	29.165
1880	3.578		21.450	6.114	0.001	3.578	27.565	31.143
1881	3.250		22.068	6.163	0.001	3.250	28.232	31.483
1882	3.689		22.866	6.240	0.001	3.689	29.107	32.796
1883	4.349		23.716	6.280	0.001	4.349	29.997	34.346
1884	4.708		24.488	6.323	0.001	4.708	30.812	35.520
1885	5.227		25.312	6.363	0.001	5.227	31.676	36.903
1886	5.268		26.033	6.403	0.001	5.268	32.437	37.705
1887	5.528		26.806	6.440	0.001	5.528	33.247	38.775
1888	6.328		27.656	6.480	0.001	6.328	34.136	40.464
1889	6.119		28.351	6.522	0.001	6.119	34.874	40.993
1890	6.421		29.098	7.185	0.001	6.421	36.284	42.705
1891	7.111		29.819	6.928	0.001	7.111	36.748	43.858
1892	7.307		30.385	6.710	0.002	7.307	37.097	44.404
1893	7.116		30.900	6.501	0.003	7.116	37.404	44.520
1894	7.710		31.595	6.332	0.004	7.710	37.931	45.641
1895	5.568		32.188	6.203	0.005	5.568	38.395	43.963
1896	8.101		32.754	6.111	0.006	8.101	38.871	46.972
1897	8.891		33.321	6.028	0.007	8.891	39.356	48.247
1898	9.873		34.248	5.982	0.008	9.873	40.238	50.110
1899	14.193	0.100	34.634	5.973	0.009	14.293	40.616	54.909
1900	12.653	0.100	36.333	5.970	0.010	12.754	42.313	55.067
1901	14.298	0.206	37.312	6.047	0.010	14.503	43.369	57.872
1902	14.768	0.108	37.750	6.173	0.011	14.876	43.933	58.809
1903	14.482	0.156	38.419	6.375	0.012	14.638	44.806	59.444
1904	15.385	0.159	39.114	6.624	0.012	15.544	45.750	61.294
1905	15.808	0.172	39.810	6.909	0.013	15.980	46.731	62.711
1906	18.616	0.176	41.020	7.195	0.013	18.792	48.228	67.020
1907	19.715	0.208	41.973	7.449	0.014	19.923	49.436	69.359
1908	21.211	0.196	42.900	7.729	0.014	21.407	50.642	72.049
1909	18.994	0.275	43.054	7.931	0.015	19.269	51.000	70.269
1910	23.548	0.301	44.316	8.060	0.015	23.849	52.391	76.240
1911	25.075	0.337	45.500	8.177	0.016	25.412	53.693	79.105

1912	26.755	0.456		46.736	8.257	0.017	27.211	55.010	82.221
1913	27.648	0.395		47.869	8.336	0.018	28.043	56.224	84.267
1914	31.446	0.417		49.183	8.386	0.019	31.863	57.587	89.450
1915	28.328	0.451		49.595	8.459	0.020	28.779	58.073	86.852
1916	26.069	0.570		49.801	8.536	0.021	26.639	58.357	84.996
1917	27.251	0.600		50.934	8.582	0.022	27.851	59.537	87.388
1918	29.598	0.515		52.144	8.659	0.023	30.113	60.825	90.938
1919	27.714	0.646		52.788	8.705	0.024	28.360	61.516	89.876
1920	31.621	0.812		54.436	8.785	0.025	32.433	63.245	95.678
1921	28.189	1.025		54.642	8.867	0.034	29.214	63.543	92.757
1922	30.199	1.296		55.903	8.987	0.058	31.495	64.949	96.444
1923	30.999	1.644		56.908	9.110	0.093	32.643	66.110	98.753
1924	33.523	2.091		58.169	9.236	0.136	35.613	67.541	103.154
1925	35.002	2.664		59.431	9.359	0.183	37.667	68.973	106.640
1926	35.146	3.215		60.178	9.451	0.233	38.361	69.861	108.222
1927	36.478	3.882		61.465	9.567	0.280	40.360	71.313	111.673
1928	33.680	4.688		61.671	9.650	0.323	38.368	71.645	110.013
1929	31.330	5.663		62.186	9.696	0.359	36.994	72.241	109.235
1930	29.680	5.528		62.650	9.730	0.383	35.209	72.763	107.972
1931	26.085	5.398		62.804	9.730	0.398	31.483	72.932	104.415
1932	26.112	5.270		63.757	9.727	0.405	31.382	73.889	105.271
1933	27.347	5.144		64.761	9.721	0.408	32.492	74.890	107.382
1934	29.140	5.694		65.869	9.715	0.408	34.834	75.991	110.825
1935	31.881	6.302		67.156	9.736	0.405	38.184	77.297	115.481
1936	33.781	6.976		68.186	9.730	0.403	40.757	78.319	119.075
1937	35.992	8.547		69.525	9.755	0.403	44.538	79.682	124.221
1938	35.122	9.755		70.014	9.751	0.405	44.878	80.171	125.048
1939	39.612	10.258		71.585	9.782	0.411	49.869	81.778	131.648
1940	36.881	10.789		71.637	9.813	0.425	47.670	81.874	129.544
1941	42.960	11.350		74.083	10.003	0.442	54.310	84.528	138.838
1942	45.228	11.941		75.757	10.408	0.461	57.168	86.625	143.794
1943	44.024	12.564		76.915	10.985	0.481	56.588	88.382	144.970
1944	43.285	13.221		77.817	11.685	0.504	56.506	90.006	146.512
1945	41.606	13.914		78.950	12.437	0.529	55.520	91.916	147.436
1946	44.389	14.645		80.598	13.260	0.555	59.034	94.412	153.446
1947	46.906	15.416		82.503	14.027	0.582	62.322	97.112	159.434
1948	47.297	16.229		83.894	14.733	0.612	63.526	99.238	162.765
1949	46.561	17.089		85.052	15.316	0.643	63.650	101.011	164.661
1950	51.527	17.994		88.606	15.685	0.675	69.521	104.965	174.486
1951	53.739	18.556		91.593	16.022	0.710	72.294	108.325	180.619
1952	58.749	19.135		93.988	16.329	0.748	77.884	111.065	188.949
1953	55.440	19.732		96.279	16.667	0.790	75.172	113.736	188.907
1954	59.101	24.443		99.421	17.035	0.834	83.545	117.290	200.834
1955	58.824	29.155		101.790	17.403	0.881	87.978	120.075	208.053
1956	59.626	30.986		104.159	17.772	0.931	90.612	122.862	213.474
1957	59.841	32.817		106.528	18.171	0.983	92.658	125.681	218.339
1958	60.876	34.945		109.412	18.539	1.032	95.822	128.983	224.805
1959	62.200	37.220		112.837	18.938	1.094	99.420	132.869	232.288
1960	67.923	39.650	0.241	115.798	19.368	1.146	107.814	136.311	244.125
1961	69.439	42.726	0.243	119.094	19.307	1.208	112.408	139.608	252.016
1962	65.411	44.359	0.236	122.828	19.798	1.280	110.005	143.905	253.910
1963	70.161	50.627	0.255	125.918	20.258	1.362	121.043	147.538	268.580
1964	73.242	56.343	0.250	129.523	20.780	1.445	129.835	151.747	281.582
1965	75.558	56.583	0.262	133.128	21.240	1.538	132.403	155.905	288.308
1966	77.894	60.878	0.262	131.583	21.394	1.620	139.035	154.596	293.631
1967	79.344	66.333	0.255	136.733	22.069	1.703	145.933	160.504	306.437
1968	81.205	71.675	0.265	141.625	22.775	1.785	153.144	166.185	319.329
1969	83.934	73.682	0.888	147.548	23.327	1.868	158.504	172.743	331.247
1970	84.764	82.231	3.782	152.183	22.529	1.816	170.777	176.528	347.305
1971	84.443	86.309	5.557	153.213	21.240	2.350	176.310	176.803	353.113
1972	88.106	88.488	8.090	161.453	25.200	2.548	184.684	189.200	373.884
1973	92.221	94.267	10.212	159.393	21.670	2.703	196.700	183.765	380.465

1974	96.178	98.430	11.670	162.483	23.205	2.741	206.279	188.428	394.707
1975	98.722	96.805	12.552	162.998	24.924	2.812	208.078	190.733	398.811
1976	102.053	99.064	15.766	163.770	27.809	3.013	216.883	194.592	411.474
1977	106.010	103.158	19.067	159.908	27.348	3.253	228.235	190.509	418.744
1978	108.207	104.003	20.078	155.015	23.972	3.545	232.288	182.532	414.820
1979	112.331	105.307	21.646	153.728	27.103	3.480	239.284	184.311	423.595
1980	115.611	100.448	24.403	153.213	28.607	3.392	240.462	185.211	425.674
1981	118.455	98.518	26.707	154.243	23.082	3.821	243.680	181.146	424.825
1982	119.573	97.031	27.876	155.015	26.919	3.392	244.481	185.325	429.806
1983	120.022	87.163	30.260	152.955	23.604	3.513	237.445	180.072	417.517
1984	126.279	90.018	31.111	156.560	23.880	4.517	247.409	184.956	432.365
1985	130.101	89.842	34.392	157.333	28.883	5.276	254.334	191.491	445.825
1986	133.940	88.764	38.348	160.680	25.875	5.235	261.052	191.791	452.842
1987	138.541	91.597	38.684	159.393	23.113	5.460	268.823	187.965	456.788
1988	145.859	95.553	40.118	157.333	23.297	5.846	281.530	186.476	468.006
1989	153.158	99.233	43.181	161.710	24.125	6.430	295.572	192.266	487.837
1990	156.570	102.964	43.313	160.680	24.494	6.298	302.847	191.472	494.320
1991	159.395	99.460	42.695	159.908	24.095	6.315	301.551	190.317	491.868
1992	160.774	101.664	44.436	158.363	23.972	5.861	306.875	188.195	495.070
1993	161.701	103.965	45.390	155.530	24.770	4.929	311.056	185.229	496.285
1994	164.635	109.136	48.580	153.213	25.476	3.266	322.351	181.955	504.305
1995	170.234	118.488	48.424	152.440	24.893	2.759	337.145	180.092	517.237
1996	176.850	120.883	50.001	152.183	26.305	2.233	347.733	180.720	528.453
1997	185.911	123.493	50.014	155.788	27.133	2.248	359.418	185.169	544.587
1998	193.527	123.683	49.929	154.500	27.164	2.811	367.139	184.475	551.614
1999	194.645	126.295	52.445	151.410	27.625	2.721	373.385	181.756	555.141
2000	195.131	126.617	53.795	156.303	28.852	3.116	375.543	188.271	563.813
2001	193.983	126.913	57.740	155.530	29.528	4.219	378.636	189.277	567.913
2002	198.121	128.722	58.481	153.470	30.172	4.675	385.325	188.317	573.642
2003	206.071	129.222	55.884	147.548	29.129	5.454	391.177	182.130	573.307
2004	214.851	131.931	56.024	148.835	31.062	5.986	402.806	185.884	588.690
2005	214.617	134.115	54.988	151.153	31.185	6.878	403.720	189.216	592.936
2006	219.933	138.046	60.569	150.380	30.878	5.865	418.548	187.123	605.670
2007	215.980	139.892	67.645	149.608	29.098	6.360	423.516	185.066	608.582
2008	226.312	140.588	66.025	146.260	29.466	6.336	432.925	182.062	614.987
2009	217.497	136.671	67.472	145.488	29.896	7.257	421.640	182.641	604.281
2010	212.983	138.180	73.440	142.913	29.835	7.129	424.602	179.876	604.478
2011	207.811	145.039	74.932	144.458	30.847	7.797	427.781	183.102	610.883
2012	196.334	149.148	76.174	144.973	31.277	7.478	421.656	183.727	605.383
2013	185.874	153.372	80.104	144.973	30.111	8.055	419.350	183.138	602.488
2014	183.918	154.047	86.375	142.398	30.786	8.693	424.340	181.877	606.217
2015	190.305	153.917	88.866	142.140	30.142	9.703	433.089	181.984	615.073
2016	189.201	154.884	86.844	141.368	30.203	9.919	430.929	181.489	612.419
2017	183.119	162.362	85.694	143.170	31.983	10.001	431.175	185.154	616.329
2018	179.173	164.702	82.084	143.943	30.878	10.249	425.959	185.069	611.028
2019	172.577	163.953	95.647	137.505	30.142	11.248	432.177	178.894	611.071
2020	166.082	141.424	92.525	137.505	29.149	10.815	400.030	177.469	577.499

Asia GHG emissions

Figure B.11 Total and per capita GHG emissions per source in Asia 1820-2020 (Mtons and tons)

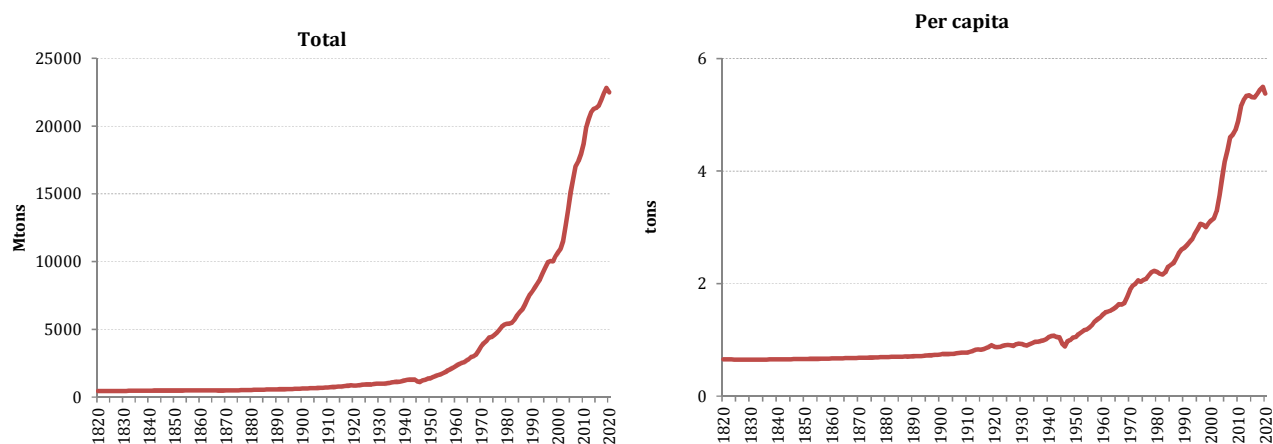


Table B.10 Total GHG emissions per source in Asia 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	
1820	7.966			421.637	16.228		7.966	437.865	445.831
1821	8.002			422.820	16.313		8.002	439.133	447.135
1822	8.038			423.965	16.401		8.038	440.367	448.405
1823	8.074			424.811	16.524		8.074	441.334	449.408
1824	8.110			425.962	16.576		8.110	442.538	450.648
1825	8.147			427.077	16.666		8.147	443.742	451.889
1826	8.183			428.182	16.751		8.183	444.933	453.116
1827	8.220			429.510	16.833		8.220	446.343	454.563
1828	8.257			430.359	16.924		8.257	447.283	455.540
1829	8.294			431.433	17.008		8.294	448.441	456.734
1830	8.331			432.496	17.091		8.331	449.587	457.918
1831	8.346			433.985	17.212		8.346	451.197	459.543
1832	8.362			435.552	17.364		8.362	452.917	461.279
1833	8.378			437.302	17.520		8.378	454.822	463.200
1834	8.393			438.846	17.670		8.393	456.516	464.909
1835	8.409			440.365	17.795		8.409	458.160	466.569
1836	8.425			441.910	17.948		8.425	459.859	468.284
1837	8.441			443.952	18.102		8.441	462.054	470.494
1838	8.456			445.447	18.227		8.456	463.674	472.130
1839	8.472			446.996	18.413		8.472	465.409	473.881
1840	8.488			448.520	18.532		8.488	467.052	475.540
1841	8.501			450.526	18.700		8.501	469.226	477.727
1842	8.514			452.274	18.831		8.514	471.105	479.619
1843	8.527			454.258	18.999		8.527	473.257	481.784
1844	8.540			455.983	19.161		8.540	475.145	483.685
1845	8.553			458.023	19.296		8.553	477.320	485.873
1846	8.566			459.776	19.494		8.566	479.270	487.836
1847	8.579			461.796	19.626		8.579	481.422	490.001
1848	8.591			463.526	19.796		8.591	483.322	491.913
1849	8.604			465.576	19.932		8.604	485.508	494.112
1850	8.617			467.548	20.148	0.009	8.617	487.705	496.322
1851	8.557			467.247	20.507	0.009	8.557	487.763	496.320
1852	8.497			467.397	20.900	0.009	8.497	488.306	496.803
1853	8.437			467.312	21.264	0.009	8.437	488.584	497.022

1854	8.377		467.177	21.589	0.009	8.377	488.775	497.152
1855	8.317		467.018	21.880	0.009	8.317	488.906	497.224
1856	8.257		466.835	22.202	0.009	8.257	489.046	497.304
1857	8.198		466.575	22.448	0.009	8.198	489.032	497.229
1858	8.138		466.641	22.692	0.009	8.138	489.342	497.480
1859	8.078		466.364	22.901	0.009	8.078	489.274	497.352
1860	9.030		466.383	23.100	0.009	9.030	489.492	498.522
1861	9.038		465.927	23.183	0.009	9.038	489.119	498.157
1862	9.049		465.486	23.266	0.009	9.049	488.761	497.810
1863	9.063		465.303	23.348	0.009	9.063	488.659	497.722
1864	9.080		465.133	23.423	0.009	9.080	488.565	497.645
1865	9.101		464.928	23.506	0.009	9.101	488.443	497.544
1866	9.125		464.680	23.583	0.009	9.125	488.272	497.397
1867	9.153		464.178	23.655	0.009	9.153	487.843	496.996
1868	9.197		463.933	23.734	0.009	9.197	487.675	496.872
1869	9.241		463.678	23.846	0.009	9.241	487.533	496.774
1870	9.279		463.943	23.923	0.009	9.279	487.874	497.153
1871	9.414		466.220	24.247	0.009	9.414	490.476	499.889
1872	9.550		468.202	24.955	0.009	9.550	493.166	502.716
1873	9.688		470.524	25.941	0.009	9.688	496.473	506.162
1874	10.434		472.732	27.125	0.009	10.434	499.866	510.299
1875	11.647		474.985	28.423	0.009	11.647	503.417	515.064
1876	11.764		477.733	29.700	0.009	11.764	507.442	519.207
1877	11.797		479.854	31.027	0.009	11.797	510.890	522.687
1878	12.556		482.293	32.152	0.009	12.556	514.454	527.011
1879	13.233	0.064	484.802	33.028	0.009	13.298	517.839	531.137
1880	13.481	0.103	486.845	33.659	0.009	13.584	520.514	534.098
1881	13.806	0.091	489.589	33.988	0.009	13.896	523.586	537.483
1882	13.955	0.198	492.467	34.288	0.009	14.154	526.763	540.917
1883	14.333	0.134	494.889	34.505	0.009	14.467	529.402	543.869
1884	14.881	0.262	497.615	34.685	0.009	15.142	532.309	547.451
1885	15.540	0.185	499.956	34.852	0.009	15.725	534.817	550.542
1886	15.965	0.312	502.611	35.026	0.009	16.276	537.646	553.923
1887	17.271	0.299	505.332	35.233	0.009	17.570	540.574	558.144
1888	18.272	0.378	507.763	35.406	0.009	18.649	543.177	561.827
1889	19.568	0.544	510.702	35.617	0.009	20.112	546.328	566.440
1890	20.475	0.559	512.881	36.900	0.009	21.034	549.790	570.824
1891	22.580	0.608	515.946	37.253	0.010	23.187	553.209	576.396
1892	23.322	0.705	518.743	37.634	0.014	24.027	556.391	580.418
1893	23.797	1.182	522.433	38.049	0.019	24.978	560.501	585.480
1894	27.440	0.930	525.383	38.446	0.026	28.370	563.855	592.225
1895	29.956	1.277	528.304	38.838	0.033	31.233	567.175	598.408
1896	32.347	1.413	531.430	39.255	0.042	33.759	570.727	604.486
1897	33.434	2.111	534.364	39.699	0.050	35.544	574.113	609.657
1898	39.085	2.245	537.448	40.109	0.058	41.329	577.615	618.944
1899	40.391	1.914	540.354	40.591	0.065	42.305	581.010	623.315
1900	44.929	2.436	543.073	41.051	0.070	47.365	584.195	631.560
1901	50.629	3.590	545.443	41.515	0.075	54.219	587.033	641.252
1902	54.518	2.943	546.239	42.026	0.079	57.460	588.344	645.804
1903	55.950	4.531	548.420	42.579	0.083	60.481	591.083	651.564
1904	61.151	5.418	550.166	43.105	0.087	66.568	593.359	659.927
1905	63.124	6.024	551.847	43.674	0.091	69.148	595.612	664.760
1906	70.511	6.525	556.172	44.351	0.095	77.036	600.618	677.654
1907	77.301	7.301	558.204	44.964	0.099	84.602	603.266	687.868
1908	86.244	7.764	560.801	45.606	0.103	94.009	606.510	700.519
1909	88.715	8.842	561.856	46.222	0.107	97.557	608.186	705.743
1910	91.870	7.418	562.871	46.953	0.112	99.288	609.935	709.224
1911	101.862	8.186	568.206	47.530	0.117	110.048	615.854	725.902
1912	121.837	7.143	569.662	48.301	0.123	128.980	618.085	747.065
1913	139.410	7.772	574.375	49.124	0.129	147.182	623.628	770.810
1914	146.514	7.935	579.176	49.981	0.135	154.449	629.291	783.741
1915	141.053	7.802	583.124	50.918	0.142	148.856	634.184	783.039

1916	156.075	8.285		587.506	51.849	0.149	164.360	639.504	803.864
1917	171.388	8.008		591.439	52.796	0.156	179.395	644.390	823.786
1918	185.178	8.011		599.053	53.685	0.164	193.189	652.901	846.090
1919	216.357	8.429		603.986	54.579	0.172	224.786	658.737	883.523
1920	192.759	8.787		605.736	55.469	0.180	201.546	661.385	862.931
1921	185.573	9.121	0.174	611.764	56.464	0.270	194.868	668.498	863.367
1922	190.425	9.369	0.256	619.379	57.445	0.504	200.051	677.327	877.378
1923	206.427	10.336	0.475	625.276	58.446	0.846	217.238	684.567	901.805
1924	219.665	11.177	0.585	633.629	59.394	1.267	231.426	694.291	925.716
1925	223.079	12.837	0.816	639.118	60.394	1.732	236.732	701.245	937.977
1926	219.850	12.095	0.699	643.832	61.316	2.210	232.644	707.357	940.001
1927	200.417	14.791	0.718	652.578	62.308	2.668	215.926	717.554	933.480
1928	237.409	15.050	0.942	658.442	63.256	3.080	253.401	724.778	978.179
1929	242.756	16.610	1.054	667.337	64.159	3.401	260.421	734.897	995.318
1930	239.183	18.569	1.066	671.422	65.119	3.608	258.818	740.150	998.967
1931	223.845	19.068	1.621	677.026	65.827	3.684	244.534	746.537	991.071
1932	214.974	19.509	1.698	681.002	66.751	3.684	236.181	751.437	987.619
1933	242.604	17.089	1.939	690.136	67.739	3.626	261.631	761.501	1,023.132
1934	258.754	19.625	2.064	697.962	68.904	3.529	280.442	770.395	1,050.837
1935	281.255	21.954	2.088	710.386	70.102	3.412	305.297	783.899	1,089.196
1936	296.189	10.732	2.005	718.479	71.305	3.307	308.926	793.091	1,102.018
1937	304.003	14.241	2.175	726.865	72.547	3.204	320.419	802.617	1,123.035
1938	315.102	13.975	2.329	737.703	73.883	3.144	331.407	814.730	1,146.137
1939	340.897	15.178	2.388	745.226	75.049	3.150	358.463	823.425	1,181.888
1940	383.174	11.896	2.464	759.753	76.254	3.223	397.534	839.230	1,236.764
1941	413.022	10.727	0.104	770.680	78.803	3.368	423.853	852.850	1,276.704
1942	417.475	11.383	0.101	779.030	83.555	3.518	428.959	866.103	1,295.062
1943	393.008	9.984	0.098	786.680	90.182	3.717	403.090	880.578	1,283.668
1944	386.431	11.800	0.095	793.031	97.642	3.930	398.325	894.603	1,292.929
1945	248.026	13.527	0.092	790.336	106.406	4.175	261.645	900.916	1,162.561
1946	190.995	12.912	0.089	791.838	114.933	4.424	203.996	911.195	1,115.191
1947	238.592	15.568	0.163	849.651	131.159	5.007	254.323	985.817	1,240.140
1948	256.019	16.192	1.066	864.209	138.947	5.294	273.277	1,008.450	1,281.727
1949	311.542	16.625	1.645	877.920	144.717	5.590	329.811	1,028.227	1,358.038
1950	332.971	25.584	1.723	869.674	146.496	5.809	360.277	1,021.979	1,382.256
1951	383.837	36.588	2.173	898.493	149.737	6.160	422.597	1,054.390	1,476.988
1952	426.457	37.861	2.904	922.172	153.203	6.510	467.221	1,081.885	1,549.106
1953	478.657	49.050	3.689	938.496	156.406	6.885	531.396	1,101.788	1,633.184
1954	497.592	56.538	4.294	954.729	159.871	7.274	558.425	1,121.874	1,680.298
1955	535.199	69.740	5.433	976.253	163.359	7.678	610.372	1,147.291	1,757.663
1956	596.193	82.095	6.146	995.574	167.409	8.124	684.434	1,171.108	1,855.542
1957	680.443	97.319	6.874	1,019.404	170.857	8.567	784.636	1,198.828	1,983.464
1958	709.061	103.911	7.150	1,078.102	174.692	9.025	820.122	1,261.819	2,081.942
1959	716.857	131.828	8.033	1,127.122	178.573	9.532	856.717	1,315.228	2,171.945
1960	771.592	170.883	6.062	1,161.064	184.170	10.143	948.537	1,355.378	2,303.915
1961	824.377	219.477	7.394	1,154.845	195.285	10.880	1,051.248	1,361.010	2,412.259
1962	855.628	253.058	8.854	1,148.759	201.846	11.615	1,117.541	1,362.221	2,479.761
1963	870.126	304.259	10.628	1,159.865	208.147	12.348	1,185.013	1,380.360	2,565.373
1964	875.520	360.610	11.336	1,190.130	217.869	13.127	1,247.467	1,421.126	2,668.593
1965	906.734	419.551	11.627	1,212.737	227.617	13.964	1,337.912	1,454.317	2,792.230
1966	956.794	477.318	12.501	1,247.869	241.774	14.801	1,446.613	1,504.444	2,951.057
1967	922.225	559.138	12.939	1,250.132	243.613	15.677	1,494.302	1,509.423	3,003.724
1968	933.097	642.995	13.859	1,277.435	252.152	16.534	1,589.951	1,546.121	3,136.072
1969	1,065.326	763.592	15.585	1,310.916	258.716	17.342	1,844.503	1,586.974	3,431.477
1970	1,207.668	897.520	19.663	1,341.528	265.215	17.770	2,124.851	1,624.512	3,749.364
1971	1,299.530	1,011.564	22.620	1,365.810	270.834	21.814	2,333.714	1,658.458	3,992.171
1972	1,353.341	1,092.238	25.380	1,381.000	282.233	24.335	2,470.959	1,687.567	4,158.527
1973	1,376.393	1,255.960	30.512	1,402.567	295.548	26.086	2,662.865	1,724.202	4,387.067
1974	1,405.682	1,247.194	40.059	1,412.619	292.639	26.826	2,692.936	1,732.085	4,425.020
1975	1,522.449	1,231.329	50.188	1,452.266	306.329	28.362	2,803.966	1,786.957	4,590.923
1976	1,553.377	1,308.368	57.985	1,465.232	308.171	35.086	2,919.730	1,808.488	4,728.219
1977	1,660.042	1,364.801	74.936	1,495.820	328.948	39.379	3,099.779	1,864.148	4,963.927

1978	1,748.029	1,434.013	98.034	1,518.049	353.844	41.920	3,280.075	1,913.812	5,193.887
1979	1,825.160	1,462.908	114.225	1,530.034	370.146	46.502	3,402.293	1,946.682	5,348.975
1980	1,932.173	1,363.975	119.342	1,549.375	383.777	48.466	3,415.490	1,981.618	5,397.107
1981	1,993.621	1,317.202	117.635	1,564.270	384.830	45.738	3,428.457	1,994.838	5,423.295
1982	2,067.342	1,275.788	122.269	1,585.568	399.820	43.182	3,465.399	2,028.570	5,493.969
1983	2,181.041	1,288.918	137.209	1,625.090	419.980	43.890	3,607.168	2,088.960	5,696.128
1984	2,375.207	1,346.098	169.577	1,664.860	437.791	51.568	3,890.883	2,154.219	6,045.102
1985	2,575.333	1,325.187	185.418	1,695.055	432.279	51.857	4,085.938	2,179.190	6,265.128
1986	2,676.115	1,367.012	202.508	1,733.768	443.742	50.483	4,245.636	2,227.993	6,473.629
1987	2,899.647	1,409.462	212.187	1,755.485	474.884	52.870	4,521.296	2,283.238	6,804.533
1988	3,122.420	1,523.407	226.922	1,809.248	499.007	56.691	4,872.748	2,364.946	7,237.694
1989	3,288.384	1,607.101	243.668	1,866.359	513.284	63.400	5,139.153	2,443.044	7,582.196
1990	3,385.297	1,681.183	260.761	1,872.314	527.820	67.988	5,327.241	2,468.121	7,795.362
1991	3,544.520	1,742.573	290.692	1,898.899	539.354	73.454	5,577.785	2,511.707	8,089.492
1992	3,702.040	1,844.302	308.472	1,910.889	553.374	76.853	5,854.815	2,541.117	8,395.931
1993	3,915.848	1,900.589	318.494	1,922.115	549.502	86.334	6,134.932	2,557.951	8,692.883
1994	4,148.285	1,998.979	344.909	1,959.624	571.341	98.794	6,492.173	2,629.760	9,121.933
1995	4,247.535	2,109.268	360.580	2,058.702	636.830	103.828	6,717.382	2,799.359	9,516.741
1996	4,435.706	2,216.476	389.182	2,124.710	683.128	106.663	7,041.364	2,914.501	9,955.866
1997	4,420.414	2,311.217	421.230	2,103.720	668.775	112.089	7,152.861	2,884.584	10,037.444
1998	4,393.205	2,280.156	433.200	2,133.408	689.675	99.861	7,106.562	2,922.944	10,029.506
1999	4,517.788	2,386.607	462.653	2,183.938	713.841	129.006	7,367.048	3,026.785	10,393.833
2000	4,654.672	2,471.219	498.749	2,222.600	719.448	114.528	7,624.639	3,056.576	10,681.215
2001	4,867.630	2,468.022	521.768	2,241.468	729.033	122.425	7,857.420	3,092.927	10,950.347
2002	5,274.418	2,553.695	541.827	2,240.170	758.669	143.045	8,369.939	3,141.884	11,511.823
2003	6,099.467	2,702.234	593.459	2,309.752	788.127	160.598	9,395.159	3,258.477	12,653.636
2004	6,932.673	2,892.082	606.840	2,410.193	826.989	191.570	10,431.594	3,428.752	13,860.346
2005	7,978.884	2,901.131	657.095	2,506.151	852.170	224.014	11,537.110	3,582.334	15,119.444
2006	8,652.044	2,961.987	708.316	2,581.653	883.652	257.426	12,322.347	3,722.730	16,045.077
2007	9,438.281	3,050.073	768.474	2,633.965	914.879	253.320	13,256.828	3,802.165	17,058.993
2008	9,655.605	3,057.409	831.022	2,671.060	939.475	271.047	13,544.036	3,881.582	17,425.618
2009	10,039.657	3,064.559	857.628	2,718.044	969.283	277.207	13,961.844	3,964.534	17,926.377
2010	10,421.375	3,264.326	948.336	2,778.196	981.727	289.876	14,634.038	4,049.799	18,683.837
2011	11,230.901	3,380.779	1,044.953	2,875.044	1,047.785	311.115	15,656.633	4,233.944	19,890.578
2012	11,538.180	3,569.211	1,118.671	2,863.525	1,112.237	335.669	16,226.063	4,311.431	20,537.494
2013	11,893.091	3,627.831	1,164.419	2,826.624	1,104.506	402.878	16,685.342	4,334.008	21,019.350
2014	12,018.717	3,680.929	1,208.874	2,791.699	1,094.629	472.457	16,908.520	4,358.786	21,267.306
2015	11,931.120	3,842.317	1,219.516	2,803.064	1,099.526	443.451	16,992.953	4,346.041	21,338.995
2016	11,917.879	3,978.802	1,250.726	2,771.138	1,113.226	469.839	17,147.407	4,354.202	21,501.609
2017	12,083.227	4,113.674	1,332.152	2,791.340	1,122.834	493.503	17,529.053	4,407.677	21,936.729
2018	12,334.814	4,210.615	1,446.163	2,784.111	1,130.979	518.007	17,991.592	4,433.096	22,424.687
2019	12,475.128	4,289.863	1,491.837	2,867.692	1,145.942	543.300	18,256.828	4,556.934	22,813.762
2020	12,387.003	4,138.439	1,506.238	2,790.528	1,140.360	541.683	18,031.680	4,472.571	22,504.251

Middle East GHG emissions

Figure B.12 Total and per capita GHG emissions per source in Middle East 1820-2020 (Mtons and tons)

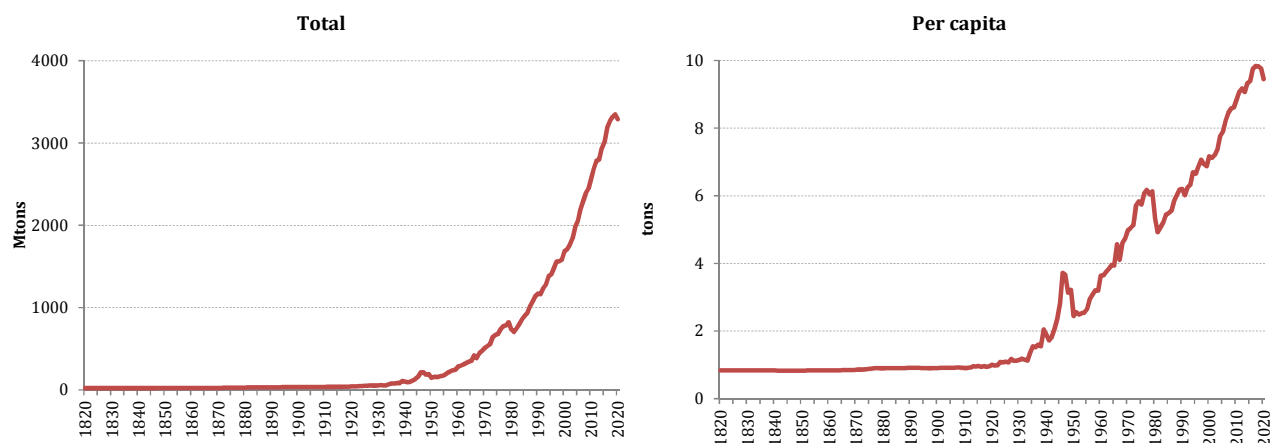


Table B.11 Total GHG emissions per source in Middle East 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils	Gases	Total
							Total	Total	World
1820				18.559	2.325			20.884	20.884
1821				18.623	2.337			20.960	20.960
1822				18.687	2.349			21.036	21.036
1823				18.778	2.361			21.139	21.139
1824				18.842	2.374			21.215	21.215
1825				18.903	2.386			21.289	21.289
1826				18.996	2.398			21.394	21.394
1827				19.056	2.411			21.467	21.467
1828				19.120	2.426			21.546	21.546
1829				19.183	2.439			21.622	21.622
1830				19.273	2.451			21.724	21.724
1831				19.333	2.463			21.796	21.796
1832				19.394	2.475			21.869	21.869
1833				19.454	2.487			21.941	21.941
1834				19.540	2.499			22.039	22.039
1835				19.603	2.511			22.114	22.114
1836				19.660	2.523			22.183	22.183
1837				19.720	2.539			22.259	22.259
1838				19.780	2.551			22.331	22.331
1839				19.869	2.563			22.432	22.432
1840				19.926	2.575			22.501	22.501
1841				19.988	2.587			22.575	22.575
1842				20.045	2.599			22.644	22.644
1843				20.136	2.611			22.747	22.747
1844				20.198	2.623			22.822	22.822
1845				20.258	2.635			22.893	22.893
1846				20.317	2.650			22.967	22.967
1847				20.402	2.663			23.065	23.065
1848				20.464	2.674			23.138	23.138
1849				20.520	2.686			23.206	23.206

1850			20.582	2.718	0.000		23.300	23.300
1851			20.663	2.767	0.000		23.430	23.430
1852			20.717	2.812	0.000		23.530	23.530
1853			20.798	2.861	0.000		23.659	23.659
1854			20.853	2.905	0.000		23.758	23.758
1855			20.907	2.946	0.000		23.853	23.853
1856			20.990	2.978	0.000		23.969	23.969
1857			21.041	3.010	0.000		24.051	24.051
1858			21.124	3.037	0.000		24.161	24.161
1859			21.175	3.052	0.000		24.228	24.228
1860			21.261	3.063	0.000		24.324	24.324
1861			21.323	3.073	0.000		24.396	24.396
1862			21.414	3.080	0.000		24.494	24.494
1863			21.473	3.082	0.000		24.555	24.555
1864			21.567	3.092	0.000		24.659	24.659
1865	0.171		21.626	3.094	0.000	0.171	24.720	24.891
1866	0.238		21.716	3.101	0.000	0.238	24.817	25.055
1867	0.258		21.806	3.103	0.000	0.258	24.909	25.167
1868	0.199		21.867	3.109	0.000	0.199	24.977	25.176
1869	0.305		21.957	3.112	0.000	0.305	25.069	25.374
1870	0.182		22.327	3.166	0.000	0.182	25.493	25.674
1871	0.227		22.514	3.214	0.000	0.227	25.729	25.956
1872	0.281		22.676	3.326	0.000	0.281	26.002	26.283
1873	0.273		22.863	3.488	0.000	0.273	26.351	26.624
1874	0.295		23.054	3.688	0.000	0.295	26.742	27.037
1875	0.403		23.207	3.905	0.000	0.403	27.111	27.515
1876	0.318		23.397	4.126	0.000	0.318	27.523	27.841
1877	0.514		23.585	4.335	0.000	0.514	27.920	28.434
1878	0.378		23.773	4.525	0.000	0.378	28.298	28.676
1879	0.145		23.905	4.670	0.000	0.145	28.575	28.720
1880	0.159		24.092	4.763	0.000	0.159	28.855	29.015
1881	0.211		24.254	4.818	0.000	0.211	29.072	29.282
1882	0.176		24.444	4.861	0.000	0.176	29.306	29.482
1883	0.185		24.635	4.904	0.000	0.185	29.539	29.724
1884	0.202		24.793	4.940	0.000	0.202	29.733	29.936
1885	0.225		24.984	4.976	0.000	0.225	29.960	30.185
1886	0.157		25.145	5.004	0.000	0.157	30.149	30.306
1887	0.285		25.332	5.036	0.000	0.285	30.369	30.654
1888	0.308		25.493	5.068	0.000	0.308	30.562	30.869
1889	0.465		25.713	5.104	0.000	0.465	30.817	31.282
1890	0.425		25.874	5.304	0.000	0.425	31.178	31.603
1891	0.468		26.017	5.321	0.000	0.468	31.339	31.807
1892	0.476		26.161	5.342	0.000	0.476	31.503	31.979
1893	0.493		26.275	5.363	0.000	0.493	31.638	32.131
1894	0.454		26.415	5.391	0.000	0.454	31.806	32.260
1895	0.431		26.558	5.416	0.000	0.431	31.974	32.405
1896	0.514		26.672	5.441	0.000	0.514	32.113	32.626
1897	0.365		26.812	5.473	0.000	0.365	32.285	32.650
1898	0.608		26.955	5.509	0.000	0.608	32.463	33.071
1899	0.777		27.068	5.541	0.000	0.777	32.609	33.386
1900	0.771		27.240	5.573	0.000	0.771	32.813	33.584
1901	1.196		27.253	5.593	0.000	1.196	32.845	34.042
1902	1.102		27.235	5.620	0.000	1.102	32.855	33.957
1903	1.286		27.189	5.654	0.000	1.286	32.843	34.129
1904	1.466		27.197	5.688	0.000	1.466	32.886	34.352
1905	1.670		27.182	5.723	0.000	1.670	32.905	34.575
1906	1.713		27.164	5.767	0.000	1.713	32.931	34.645
1907	2.084		27.203	5.804	0.000	2.084	33.008	35.092
1908	2.154		27.153	5.848	0.000	2.154	33.001	35.155
1909	1.883		27.134	5.889	0.000	1.883	33.022	34.905
1910	1.953		27.143	5.925	0.000	1.953	33.068	35.021
1911	2.000	0.138	27.323	5.944	0.000	2.138	33.267	35.404

1912	2.060	0.252		27.467	5.986	0.000	2.313	33.453	35.766
1913	2.395	0.185		28.555	6.226	0.000	2.580	34.782	37.362
1914	1.896	0.352		29.026	6.333	0.000	2.248	35.360	37.608
1915	1.436	1.213		29.506	6.409	0.000	2.650	35.915	38.565
1916	0.710	0.787		29.953	6.521	0.000	1.497	36.473	37.970
1917	1.083	1.226		30.465	6.634	0.000	2.310	37.099	39.408
1918	1.053	0.216		30.947	6.755	0.000	1.270	37.702	38.971
1919	1.678	0.000		31.465	6.913	0.000	1.678	38.378	40.056
1920	1.594	1.918		32.045	7.041	0.000	3.513	39.086	42.599
1921	1.039	1.037		32.557	7.239	0.000	2.075	39.796	41.871
1922	1.258	0.914		33.100	7.589	0.000	2.171	40.689	42.860
1923	1.841	4.085		33.716	7.977	0.000	5.926	41.692	47.618
1924	2.375	2.498		34.105	8.433	0.000	4.873	42.538	47.411
1925	2.514	3.297		34.429	8.901	0.000	5.811	43.330	49.141
1926	3.220	1.181		34.816	9.420	0.000	4.401	44.236	48.638
1927	3.361	5.398		35.441	9.902	0.000	8.758	45.342	54.100
1928	2.786	2.926		35.922	10.381	0.000	5.713	46.304	52.016
1929	2.966	2.588		36.329	10.810	0.000	5.554	47.139	52.693
1930	3.542	3.060		36.584	11.127	0.000	6.602	47.712	54.314
1931	3.440	4.961		37.098	11.475	0.000	8.401	48.573	56.975
1932	3.483	3.192		37.647	11.787	0.000	6.675	49.434	56.108
1933	4.372	0.736		38.159	12.153	0.000	5.108	50.311	55.419
1934	6.135	5.654		42.977	12.473	0.000	11.789	55.450	67.239
1935	6.572	9.992		48.271	12.843	0.000	16.564	61.114	77.678
1936	6.659	8.542		49.182	13.164	0.000	15.201	62.347	77.547
1937	6.853	11.204		50.669	13.529	0.000	18.057	64.197	82.254
1938	4.668	10.938		51.411	13.889	0.000	15.606	65.299	80.906
1939	6.682	21.432		65.977	14.178	0.000	28.115	80.155	108.270
1940	7.481	17.887		60.849	14.539	0.000	25.368	75.388	100.756
1941	7.667	14.242		56.287	15.115	0.000	21.909	71.403	93.311
1942	6.753	14.376		62.693	16.014	0.000	21.129	78.707	99.836
1943	8.290	20.576		68.917	17.134	0.000	28.866	86.051	114.917
1944	6.186	30.874		76.248	18.396	0.000	37.060	94.643	131.704
1945	9.782	34.649		95.889	19.810	0.000	44.430	115.699	160.129
1946	9.644	43.692		139.186	21.116	0.000	53.336	160.302	213.638
1947	10.291	47.309		133.137	22.368	0.000	57.600	155.506	213.106
1948	10.402	39.136		111.952	23.474	0.000	49.538	135.426	184.963
1949	10.707	43.164		113.908	24.392	0.000	53.871	138.301	192.172
1950	10.903	27.397		84.356	25.072	0.005	38.300	109.432	147.732
1951	11.267	36.698		85.019	25.602	0.005	47.964	110.626	158.591
1952	11.272	36.621		84.164	26.325	0.006	47.893	110.495	158.388
1953	13.603	40.259	0.135	83.593	27.179	0.006	53.997	110.778	164.775
1954	14.225	39.553	0.809	87.706	28.066	0.007	54.587	115.779	170.366
1955	13.740	45.815	1.761	92.385	28.905	0.007	61.316	121.298	182.614
1956	14.482	57.815	2.231	103.339	29.727	0.008	74.529	133.074	207.603
1957	16.143	61.288	2.775	111.273	30.463	0.008	80.206	141.744	221.950
1958	16.736	65.968	2.678	121.098	31.136	0.009	85.382	152.242	237.624
1959	16.362	67.361	3.464	124.581	31.666	0.009	87.187	156.256	243.443
1960	15.213	80.030	4.321	152.825	32.062	0.010	99.565	184.898	284.463
1961	15.071	85.017	4.515	153.384	34.342	0.010	104.604	187.736	292.341
1962	16.096	90.406	4.776	161.988	34.857	0.011	111.279	196.856	308.135
1963	17.796	96.905	5.241	169.549	35.299	0.011	119.943	204.859	324.802
1964	19.540	102.626	7.267	178.251	36.046	0.011	129.432	214.308	343.741
1965	17.373	108.539	6.043	181.739	37.868	0.012	131.955	219.619	351.574
1966	19.299	124.066	7.053	228.417	39.597	0.012	150.417	268.027	418.444
1967	17.329	124.196	7.400	195.578	42.206	0.013	148.925	237.796	386.721
1968	18.846	137.320	8.226	236.924	44.900	0.013	164.392	281.837	446.229
1969	20.069	147.556	7.850	249.251	46.943	0.014	175.475	296.208	471.683
1970	22.225	154.629	12.428	275.975	44.525	0.037	189.282	320.536	509.818
1971	22.361	172.789	13.279	277.032	45.335	0.243	208.430	322.610	531.039
1972	24.516	180.680	14.867	288.799	46.990	0.423	220.063	336.212	556.275
1973	26.212	207.780	17.032	337.313	48.796	0.764	251.024	386.873	637.897

1974	28.643	225.745	18.094	346.726	49.841	1.000	272.482	397.566	670.049
1975	32.315	231.584	20.340	341.673	52.371	1.584	284.240	395.629	679.868
1976	33.574	256.347	23.356	369.878	55.842	1.780	313.277	427.499	740.776
1977	34.474	289.239	24.801	366.824	58.240	2.000	348.515	427.064	775.579
1978	32.623	298.705	25.459	364.553	60.026	1.814	356.788	426.393	783.181
1979	34.851	326.517	32.941	362.063	61.963	1.905	394.310	425.931	820.241
1980	36.784	294.776	36.646	301.244	64.269	1.978	368.207	367.491	735.698
1981	36.522	317.314	39.186	241.781	66.550	2.117	393.022	310.448	703.470
1982	44.482	342.921	45.570	244.127	69.406	2.318	432.973	315.850	748.823
1983	49.954	384.516	47.091	240.953	73.131	2.324	481.561	316.408	797.970
1984	56.498	414.133	64.807	246.843	73.157	2.959	535.438	322.960	858.398
1985	65.875	433.908	68.412	251.173	73.102	3.661	568.194	327.936	896.130
1986	72.078	428.957	83.328	272.205	75.798	3.962	584.364	351.965	936.329
1987	76.135	460.251	95.458	297.719	79.325	3.992	631.844	381.036	1,012.880
1988	74.031	476.900	108.291	332.225	80.217	4.516	659.222	416.959	1,076.181
1989	81.418	481.085	124.835	362.131	83.503	4.933	687.338	450.568	1,137.906
1990	85.769	502.561	148.427	343.968	84.549	5.480	736.757	433.997	1,170.754
1991	93.216	509.451	159.224	312.685	84.465	6.337	761.891	403.487	1,165.378
1992	95.191	541.848	177.621	327.723	89.551	5.916	814.660	423.190	1,237.850
1993	92.787	599.797	151.948	341.327	90.034	5.118	844.532	436.478	1,281.010
1994	94.628	658.875	183.750	354.770	88.848	4.869	937.254	448.487	1,385.740
1995	99.400	661.939	199.720	351.649	89.063	4.443	961.059	445.154	1,406.213
1996	113.447	690.205	222.019	363.024	92.050	4.145	1,025.672	459.218	1,484.889
1997	125.993	717.033	235.140	382.771	95.322	4.019	1,078.166	482.113	1,560.278
1998	132.935	693.152	258.844	376.397	99.209	4.604	1,084.931	480.210	1,565.141
1999	125.285	687.514	284.648	383.474	98.320	5.031	1,097.446	486.825	1,584.271
2000	139.542	723.535	309.001	410.201	98.553	4.993	1,172.079	513.747	1,685.825
2001	125.511	746.763	336.523	396.444	99.376	5.273	1,208.798	501.093	1,709.890
2002	131.247	759.541	378.441	386.517	102.155	5.461	1,269.228	494.133	1,763.361
2003	140.554	772.449	398.355	424.469	102.487	5.436	1,311.357	532.391	1,843.748
2004	147.554	818.040	448.298	437.733	119.956	5.180	1,413.892	562.869	1,976.761
2005	149.135	844.815	481.711	455.493	119.883	5.661	1,475.661	581.037	2,056.698
2006	168.029	894.379	520.388	474.337	124.535	6.008	1,582.796	604.880	2,187.676
2007	185.845	926.945	575.810	471.896	130.146	6.616	1,688.600	608.658	2,297.258
2008	185.037	975.480	621.284	483.718	116.905	7.789	1,781.800	608.412	2,390.213
2009	191.460	1002.960	641.305	495.107	115.653	6.359	1,835.725	617.120	2,452.845
2010	194.631	1026.829	703.165	520.524	116.421	8.559	1,924.625	645.504	2,570.129
2011	209.138	1068.364	747.685	544.017	117.144	9.794	2,025.187	670.954	2,696.141
2012	225.850	1116.174	759.863	549.258	122.183	10.794	2,101.887	682.235	2,784.122
2013	196.205	1139.676	781.449	549.986	125.852	11.714	2,117.329	687.552	2,804.881
2014	218.400	1168.491	849.402	567.656	124.933	11.683	2,236.293	704.272	2,940.565
2015	212.183	1196.155	882.779	585.470	125.947	13.245	2,291.117	724.662	3,015.779
2016	226.070	1215.497	936.527	660.782	130.971	14.657	2,378.095	806.410	3,184.504
2017	229.790	1215.013	993.868	680.871	131.944	14.366	2,438.671	827.181	3,265.852
2018	235.866	1183.797	1038.481	710.049	132.982	15.213	2,458.144	858.243	3,316.388
2019	243.001	1211.996	1049.495	689.965	137.949	16.452	2,504.493	844.366	3,348.859
2020	226.680	1145.127	1087.548	682.443	132.356	16.319	2,459.356	831.119	3,290.475

Africa GHG emissions

Figure B.13 Total and per capita GHG emissions per source in Africa 1820-2020 (Mtons and tons)

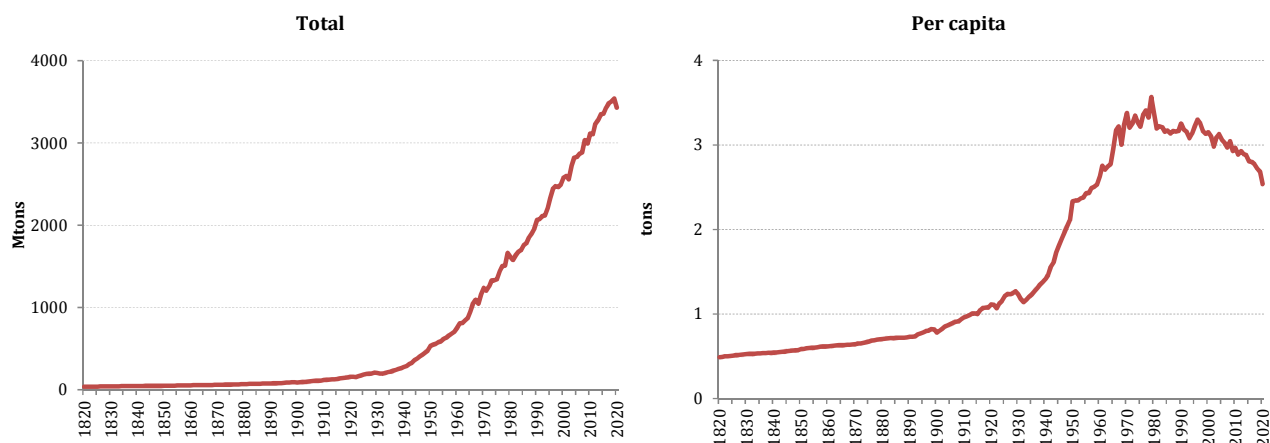


Table B.12 Total GHG emissions per source in Africa 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Coal	Oil	Gas	CH ₄	N ₂ O	Fgases	Fossils Total	Gases Total	Total
1820				29.927	6.256			36.183	36.183
1821				30.307	6.309			36.615	36.615
1822				30.699	6.361			37.061	37.061
1823				31.030	6.424			37.454	37.454
1824				31.405	6.476			37.881	37.881
1825				31.755	6.527			38.283	38.283
1826				32.131	6.590			38.721	38.721
1827				32.455	6.640			39.096	39.096
1828				32.782	6.691			39.473	39.473
1829				33.158	6.744			39.902	39.902
1830				33.522	6.802			40.323	40.323
1831				33.818	6.839			40.657	40.657
1832				34.060	6.881			40.941	40.941
1833				34.304	6.922			41.226	41.226
1834				34.596	6.957			41.553	41.553
1835				34.834	6.998			41.833	41.833
1836				35.111	7.032			42.143	42.143
1837				35.389	7.072			42.461	42.461
1838				35.669	7.116			42.785	42.785
1839				35.896	7.145			43.041	43.041
1840				36.116	7.176			43.292	43.292
1841				36.520	7.248			43.768	43.768
1842				36.887	7.314			44.201	44.201
1843				37.301	7.373			44.675	44.675
1844				37.652	7.444			45.095	45.095
1845				38.063	7.508			45.571	45.571
1846				38.477	7.573			46.049	46.049
1847				38.831	7.637			46.468	46.468
1848				39.228	7.705			46.933	46.933

1849			39.584	7.770			47.354	47.354
1850			39.978	8.639	0.000		48.617	48.617
1851			40.293	8.772	0.000		49.065	49.065
1852			40.729	8.903	0.000		49.632	49.632
1853			41.127	9.025	0.000		50.153	50.153
1854			41.563	9.133	0.000		50.696	50.696
1855			41.902	9.245	0.000		51.148	51.148
1856			42.248	9.340	0.000		51.588	51.588
1857			42.719	9.413	0.000		52.132	52.132
1858			43.103	9.484	0.000		52.587	52.587
1859			43.484	9.518	0.000		53.002	53.002
1860			43.907	9.547	0.000		53.453	53.453
1861			44.333	9.567	0.000		53.900	53.900
1862			44.757	9.575	0.000		54.332	54.332
1863			45.181	9.572	0.000		54.753	54.753
1864			45.689	9.588	0.000		55.277	55.277
1865			46.050	9.590	0.000		55.641	55.641
1866			46.503	9.590	0.000		56.094	56.094
1867			46.914	9.601	0.000		56.515	56.515
1868			47.275	9.602	0.000		56.878	56.878
1869			47.730	9.615	0.000		57.345	57.345
1870			48.173	9.627	0.000		57.800	57.800
1871			49.209	9.744	0.000		58.953	58.953
1872			49.397	10.049	0.000		59.446	59.446
1873			49.967	10.473	0.000		60.440	60.440
1874			50.626	10.982	0.000		61.609	61.609
1875			51.190	11.546	0.000		62.736	62.736
1876			51.843	12.128	0.000		63.972	63.972
1877			52.397	12.672	0.000		65.070	65.070
1878			53.002	13.151	0.000		66.153	66.153
1879			53.604	13.525	0.000		67.130	67.130
1880			54.166	13.757	0.000		67.923	67.923
1881			54.778	13.876	0.000		68.653	68.653
1882			55.357	13.986	0.000		69.343	69.343
1883			55.924	14.098	0.000		70.022	70.022
1884			56.533	14.132	0.000		70.665	70.665
1885			57.050	14.211	0.000		71.260	71.260
1886			57.687	14.293	0.000		71.980	71.980
1887			58.204	14.324	0.000		72.528	72.528
1888			58.754	14.399	0.000		73.153	73.153
1889	0.043		59.344	14.481	0.000	0.043	73.826	73.869
1890	0.136		59.918	15.078	0.000	0.136	74.996	75.132
1891	0.149		60.592	15.188	0.000	0.149	75.779	75.928
1892	0.238		61.219	15.311	0.000	0.238	76.530	76.768
1893	2.292		61.960	15.439	0.000	2.292	77.398	79.690
1894	3.090		62.670	15.566	0.000	3.090	78.236	81.326
1895	4.229		63.359	15.745	0.000	4.229	79.104	83.333
1896	5.392		64.128	15.881	0.000	5.392	80.009	85.401
1897	6.030		64.737	16.025	0.000	6.030	80.762	86.792
1898	7.614		65.498	16.159	0.000	7.614	81.656	89.270
1899	6.932		66.088	16.350	0.000	6.932	82.438	89.371
1900	2.917		66.377	16.507	0.000	2.917	82.884	85.801
1901	4.909		67.351	16.739	0.000	4.909	84.090	89.000
1902	7.299		68.371	16.917	0.000	7.299	85.288	92.587
1903	9.893		69.371	17.101	0.000	9.893	86.472	96.365
1904	11.099		70.297	17.337	0.000	11.099	87.633	98.733
1905	12.714		71.183	17.533	0.000	12.714	88.716	101.430
1906	14.317		72.118	17.779	0.000	14.317	89.897	104.214
1907	15.918		73.037	18.035	0.000	15.918	91.072	106.990
1908	16.499		73.893	18.258	0.000	16.499	92.151	108.650
1909	18.922		74.894	18.533	0.000	18.922	93.427	112.349
1910	21.396	0.206	75.878	18.872	0.000	21.603	94.750	116.353

1911	22.838	0.265		76.678	19.236	0.000	23.104	95.914	119.017
1912	24.293	0.496		77.518	19.759	0.000	24.790	97.277	122.066
1913	26.277	0.392		78.397	20.417	0.000	26.669	98.814	125.483
1914	25.711	1.072		79.483	21.297	0.000	26.783	100.781	127.563
1915	25.397	0.526		80.702	22.286	0.000	25.923	102.988	128.911
1916	30.884	1.077		82.320	23.304	0.000	31.961	105.624	137.585
1917	32.900	1.772		83.707	24.391	0.000	34.672	108.098	142.770
1918	32.352	2.817		84.883	25.429	0.000	35.169	110.312	145.482
1919	33.516	2.327		86.065	26.445	0.000	35.843	112.510	148.353
1920	39.239	1.766		87.421	27.362	0.000	41.005	114.783	155.787
1921	39.200	1.970		88.468	28.343	0.000	41.170	116.811	157.981
1922	34.041	2.009		89.317	29.388	0.000	36.050	118.705	154.756
1923	41.195	1.913		91.346	30.540	0.000	43.108	121.886	164.994
1924	45.228	2.422		92.905	31.690	0.000	47.650	124.596	172.246
1925	53.769	2.940		94.396	32.784	0.001	56.709	127.180	183.889
1926	57.477	3.637		95.886	33.817	0.001	61.114	129.704	190.817
1927	57.380	4.277		97.237	34.741	0.001	61.658	131.979	193.637
1928	59.037	5.241		98.805	35.457	0.001	64.278	134.263	198.541
1929	62.616	6.507		100.389	36.113	0.001	69.123	136.503	205.626
1930	58.250	6.645		101.384	36.418	0.001	64.894	137.803	202.698
1931	51.572	6.732		102.284	36.450	0.001	58.304	138.735	197.039
1932	47.331	6.939		103.417	36.482	0.001	54.270	139.901	194.171
1933	53.728	7.463		105.157	36.333	0.001	61.191	141.491	202.682
1934	60.404	8.016		107.059	36.244	0.001	68.420	143.304	211.724
1935	66.272	8.716		109.014	36.067	0.002	74.989	145.082	220.070
1936	71.791	9.654		113.207	35.899	0.002	81.445	149.107	230.553
1937	76.766	10.920		117.586	35.881	0.002	87.686	153.469	241.155
1938	82.539	11.894		121.864	35.968	0.002	94.433	157.834	252.267
1939	84.178	13.833		128.367	36.121	0.002	98.011	164.490	262.501
1940	86.459	18.116		132.978	36.516	0.002	104.574	169.496	274.071
1941	91.205	18.412		138.828	39.584	0.002	109.617	178.414	288.031
1942	98.487	21.534		144.633	47.300	0.002	120.022	191.935	311.957
1943	99.877	19.750		149.978	58.397	0.002	119.627	208.376	328.003
1944	109.889	19.652		156.343	71.765	0.002	129.541	228.110	357.651
1945	110.936	21.745		161.785	86.495	0.002	132.680	248.282	380.963
1946	111.405	24.084	0.275	167.273	101.220	0.002	135.764	268.495	404.259
1947	111.907	26.700	0.276	172.780	114.881	0.003	138.883	287.664	426.547
1948	113.666	29.630	0.284	179.442	126.303	0.003	143.580	305.747	449.327
1949	120.301	32.912	0.289	186.412	134.461	0.003	153.502	320.876	474.378
1950	126.917	37.269	0.301	230.786	138.052	0.003	164.487	368.841	533.329
1951	127.992	39.165	0.321	241.330	137.562	0.003	167.478	378.895	546.373
1952	134.932	41.290	0.325	247.470	134.653	0.003	176.547	382.126	558.673
1953	137.642	43.707	0.353	264.052	130.063	0.003	181.702	394.118	575.820
1954	141.874	48.456	0.390	275.460	124.618	0.004	190.719	400.081	590.801
1955	156.270	53.179	0.399	288.691	118.565	0.004	209.848	407.260	617.108
1956	163.853	52.751	0.440	302.418	112.310	0.004	217.044	414.733	631.777
1957	185.301	52.337	0.441	316.295	106.749	0.004	238.079	423.048	661.128
1958	194.241	56.636	0.471	327.636	102.344	0.004	251.348	429.985	681.333
1959	190.945	61.399	0.544	352.313	99.579	0.005	252.888	451.897	704.785
1960	199.324	66.681	0.582	384.469	99.266	0.005	266.588	483.740	750.328
1961	199.903	68.882	0.940	424.618	110.005	0.005	269.725	534.628	804.353
1962	203.382	73.260	1.509	420.945	111.449	0.005	278.151	532.399	810.551
1963	209.215	76.765	2.033	441.543	113.076	0.006	288.013	554.624	842.638
1964	224.634	92.570	3.779	435.689	114.869	0.006	320.983	550.564	871.547
1965	244.048	101.336	3.109	484.410	117.659	0.006	348.493	602.074	950.567
1966	240.096	110.474	3.527	578.445	117.506	0.007	354.098	695.957	1,050.055
1967	243.940	108.520	3.433	614.200	121.846	0.007	355.894	736.053	1,091.946
1968	254.327	116.093	3.592	545.606	125.915	0.007	374.011	671.528	1,045.540
1969	257.377	115.288	4.149	650.271	130.489	0.007	376.815	780.767	1,157.582
1970	266.130	129.985	4.199	696.494	140.856	0.000	400.314	837.350	1,237.665
1971	282.357	139.967	8.493	643.930	129.148	0.660	430.816	773.738	1,204.554
1972	283.893	153.589	9.847	674.542	132.766	1.038	447.329	808.345	1,255.674

1973	303.062	162.843	11.486	711.083	136.795	1.168	477.391	849.045	1,326.436
1974	316.402	171.558	13.395	691.559	136.155	1.607	501.354	829.320	1,330.675
1975	337.561	185.145	16.709	659.826	142.919	2.064	539.414	804.809	1,344.223
1976	354.859	201.656	19.703	719.828	143.819	2.935	576.218	866.581	1,442.799
1977	364.922	214.285	21.510	750.166	149.826	3.617	600.717	903.609	1,504.326
1978	355.350	226.983	30.754	739.928	151.875	3.915	613.087	895.718	1,508.805
1979	378.195	242.317	42.851	834.053	163.529	4.094	663.363	1,001.677	1,665.040
1980	351.132	264.882	61.849	769.729	163.583	4.484	677.863	937.796	1,615.659
1981	385.559	293.989	79.114	653.910	160.300	4.994	758.662	819.203	1,577.865
1982	413.754	312.086	81.755	660.293	163.810	5.211	807.595	829.314	1,636.909
1983	424.553	325.398	94.724	663.695	162.552	5.670	844.674	831.917	1,676.591
1984	434.907	342.747	94.965	660.581	157.974	5.776	872.620	824.331	1,696.950
1985	450.276	349.406	101.952	684.394	160.734	6.044	901.634	851.172	1,752.806
1986	461.027	345.802	112.757	691.735	165.091	6.041	919.586	862.867	1,782.453
1987	476.425	358.863	117.567	715.262	174.255	7.014	952.855	896.531	1,849.385
1988	511.233	376.817	126.287	708.186	168.182	7.044	1,014.336	883.412	1,897.748
1989	479.903	391.812	131.269	768.615	175.239	7.504	1,002.983	951.358	1,954.342
1990	491.672	401.547	133.450	840.050	189.677	7.748	1,026.669	1,037.475	2,064.145
1991	483.438	405.659	134.939	852.486	190.966	6.976	1,024.036	1,050.428	2,074.464
1992	484.092	407.609	143.105	873.894	196.849	6.523	1,034.805	1,077.265	2,112.071
1993	487.567	409.854	144.460	872.919	196.569	5.791	1,041.881	1,075.280	2,117.161
1994	503.217	414.927	151.082	938.642	197.483	5.214	1,069.226	1,141.339	2,210.564
1995	519.900	438.341	158.977	1,004.260	203.112	4.755	1,117.218	1,212.128	2,329.346
1996	530.150	450.341	166.066	1,076.101	215.952	6.937	1,146.557	1,298.990	2,445.548
1997	540.406	463.197	167.935	1,070.014	228.342	6.821	1,171.539	1,305.176	2,476.715
1998	529.699	468.527	173.844	1,044.217	240.328	7.347	1,172.070	1,291.892	2,463.961
1999	554.321	475.930	182.220	1,034.772	243.589	7.797	1,212.470	1,286.159	2,498.629
2000	555.893	478.628	193.691	1,100.040	239.779	8.554	1,228.212	1,348.374	2,576.586
2001	563.070	477.293	213.711	1,088.921	247.455	8.798	1,254.074	1,345.175	2,599.249
2002	540.312	491.836	221.341	1,036.545	260.903	9.198	1,253.489	1,306.647	2,560.136
2003	592.732	503.822	243.523	1,103.096	269.681	9.724	1,340.078	1,382.501	2,722.579
2004	648.222	512.456	261.645	1,104.659	284.896	10.533	1,422.323	1,400.088	2,822.412
2005	606.021	551.217	278.591	1,092.120	292.471	11.505	1,435.829	1,396.096	2,831.925
2006	619.293	552.816	300.211	1,085.426	296.456	12.785	1,472.319	1,394.667	2,866.987
2007	630.843	565.341	305.372	1,068.803	302.419	13.487	1,501.556	1,384.708	2,886.264
2008	699.066	596.579	331.834	1,083.276	310.369	14.140	1,627.479	1,407.785	3,035.264
2009	696.023	605.791	307.420	1,059.089	313.614	13.647	1,609.233	1,386.350	2,995.583
2010	691.368	655.670	322.296	1,102.808	328.239	13.435	1,669.334	1,444.482	3,113.815
2011	677.833	616.680	381.651	1,098.605	318.164	16.069	1,676.165	1,432.838	3,109.003
2012	666.580	653.491	409.444	1,165.247	320.582	19.966	1,729.516	1,505.795	3,235.311
2013	667.236	708.253	424.327	1,138.240	324.481	19.102	1,799.817	1,481.823	3,281.640
2014	684.516	734.966	435.251	1,145.382	329.096	22.160	1,854.733	1,496.638	3,351.371
2015	653.950	748.346	438.210	1,157.785	331.524	25.173	1,840.506	1,514.481	3,354.987
2016	700.767	751.874	453.521	1,163.487	336.424	23.179	1,906.162	1,523.089	3,429.251
2017	693.643	743.116	476.690	1,199.617	348.288	24.350	1,913.449	1,572.254	3,485.703
2018	676.265	744.388	512.617	1,195.724	349.227	25.949	1,933.269	1,570.901	3,504.170
2019	705.302	751.717	515.652	1,192.038	350.723	27.105	1,972.672	1,569.866	3,542.538
2020	670.967	694.058	511.495	1,181.087	346.110	26.549	1,876.520	1,553.746	3,430.266

GHG Emissions Per country

Table B.13 Total GHG emissions per country 1820-2020 (Mtons)

	1	2	3	4	5	6	7	8	9
	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy
	WE	WE	WE	WE	WE	WE	WE	WE	WE
1820	2.676	9.826	2.573	1.209	46.793	29.248	2.054	44.308	13.404
1830	2.968	11.312	2.863	1.407	52.824	33.450	2.252	49.098	14.230
1840	3.252	14.904	3.216	1.500	61.158	41.042	2.469	53.912	15.172
1850	3.856	17.299	4.067	1.950	73.137	51.250	2.731	45.791	16.542
1860	5.243	24.302	4.871	2.143	98.715	76.229	3.001	41.426	20.385
1870	7.762	35.370	5.956	2.327	115.219	120.809	3.493	40.338	20.807
1880	11.057	42.077	6.840	2.736	150.356	180.763	4.016	39.865	24.652
1890	15.141	52.891	8.031	3.147	178.406	266.447	4.471	37.753	33.546
1900	20.686	64.589	10.125	4.278	221.761	400.743	5.374	37.470	37.620
1910	26.017	81.626	12.592	4.991	248.897	539.390	5.861	37.250	51.789
1920	26.236	70.701	13.063	4.544	249.229	505.887	6.622	37.572	43.498
1930	26.379	110.833	21.528	7.295	370.133	635.089	9.320	28.373	67.728
1940	23.756	88.178	20.005	7.477	239.393	752.035	9.778	27.012	80.257
1950	33.113	97.244	39.667	16.054	321.190	634.158	15.204	26.968	89.506
1960	46.648	116.196	56.757	28.440	400.192	880.827	27.849	28.059	165.264
1970	66.216	169.538	78.869	53.154	602.104	1.150.163	44.463	38.401	384.063
1980	76.074	160.906	82.035	70.359	653.210	1.273.153	68.542	46.455	465.302
1990	76.126	152.468	69.645	71.636	531.480	1.165.907	92.791	51.664	469.121
2000	78.513	171.046	70.867	70.241	536.629	993.657	115.078	64.419	503.549
2010	83.786	164.553	63.287	73.334	493.362	895.116	110.448	60.668	501.716
2020	68.196	119.486	38.274	49.324	377.932	707.943	74.777	52.949	368.293

	10	11	12	13	14	15	16	17	18
	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	UK	Bulgaria	Czecho-slovakia
	WE	WE	WE	WE	WE	WE	WE	EE	EE
1820	5.021	0.946	2.453	7.075	1.977	1.419	96.743	3.404	7.164
1830	5.749	1.081	2.632	7.572	2.200	1.535	118.602	3.522	8.560
1840	6.502	1.252	2.825	7.680	2.411	1.652	154.772	3.719	10.047
1850	7.753	1.631	3.063	8.771	3.060	1.921	212.595	3.916	11.216
1860	9.520	2.036	3.314	10.754	3.755	2.341	278.015	4.005	14.045
1870	12.629	2.497	3.760	12.713	4.603	3.057	348.887	4.095	20.514
1880	17.043	3.358	4.455	15.316	6.559	4.077	434.491	4.869	29.427
1890	20.265	4.330	5.574	19.818	8.609	5.240	511.369	5.608	38.554
1900	26.555	6.928	6.383	26.684	13.884	8.691	602.685	6.135	44.384
1910	33.836	8.855	7.839	31.688	17.908	11.071	671.691	7.483	51.493
1920	35.684	8.523	6.626	30.069	15.551	10.624	683.618	9.105	70.193
1930	55.443	12.416	9.302	42.504	24.117	12.772	657.565	13.026	79.765
1940	49.977	11.061	9.604	45.310	24.480	11.967	715.920	15.023	58.058
1950	72.567	17.085	13.638	64.578	40.911	15.973	751.218	22.737	106.746
1960	100.383	25.261	16.959	90.130	54.800	26.009	831.096	38.822	181.055
1970	162.603	40.900	27.465	153.181	92.356	47.171	903.776	79.393	258.368
1980	221.999	47.436	39.167	238.488	81.777	49.605	890.285	108.354	329.192
1990	224.488	49.767	56.212	259.059	61.921	50.115	792.345	96.450	286.656
2000	226.157	51.181	80.176	352.719	55.684	49.152	717.615	55.862	211.804
2010	216.595	51.001	67.864	311.605	58.193	48.285	633.028	55.394	182.206
2020	174.576	44.159	56.285	250.275	50.666	39.650	409.676	47.192	140.382

	19	20	21	22	23	24	25	26	27
	Hungary	Poland	Romania	Yugoslavia	F. USSR	Canada	USA	Argentina	Bolivia
	EE	EE	EE	EE	EE	NA	NA	LA	LA
1820	5.903	14.942	7.382	4.011	101.180	4.258	53.002	2.372	1.920
1830	6.617	16.117	8.186	4.260	107.750	5.731	69.909	2.994	2.278
1840	7.298	18.625	8.724	4.532	122.108	7.824	94.385	3.792	2.310
1850	7.691	22.246	9.270	5.124	132.467	12.532	136.557	4.751	2.340
1860	8.965	30.264	9.991	5.473	150.001	16.612	193.156	6.005	2.778
1870	10.783	44.443	10.668	6.015	166.601	19.121	264.041	7.825	2.409
1880	12.830	60.718	11.592	6.870	211.434	24.763	421.677	11.129	2.062
1890	15.769	84.116	13.149	7.676	252.338	34.060	677.970	15.935	3.292
1900	21.342	112.732	14.415	8.117	347.175	44.401	990.206	22.588	2.876
1910	24.943	153.596	18.248	8.879	410.806	82.170	1,713.988	38.745	3.450
1920	19.654	127.373	21.554	14.074	333.232	120.370	2,186.620	47.704	5.090
1930	25.666	110.498	37.407	21.254	519.071	134.302	2,314.118	64.820	5.419
1940	29.317	252.658	49.340	22.498	948.047	151.629	2,409.599	75.205	6.494
1950	37.689	183.421	51.021	40.142	1,207.650	222.339	3,236.742	104.607	6.103
1960	64.473	272.540	99.039	59.062	2,319.581	281.417	4,056.164	156.957	7.678
1970	81.404	413.929	178.927	92.041	3,130.168	424.028	5,882.719	201.514	10.155
1980	108.310	583.403	266.839	142.111	4,312.005	588.962	6,538.929	231.826	15.977
1990	92.135	468.109	244.629	182.492	4,877.871	630.765	6,723.349	231.202	17.144
2000	72.993	375.848	134.386	139.065	3,025.327	708.931	7,595.583	273.036	46.786
2010	65.205	398.691	114.469	155.996	3,146.643	720.430	7,307.139	298.311	66.325
2020	62.906	350.186	101.221	160.577	3,146.553	692.176	6,930.294	306.108	85.593

	28	29	30	31	32	33	34	35	36
	Brazil	Chile	Colombia	Costa Rica	Cuba	Dominican Rep.	Ecuador	El Salvador	Guatemala
	LA	LA	LA	LA	LA	LA	LA	LA	LA
1820	8.198	0.880	2.181	0.105	2.767	0.117	0.499	0.195	0.475
1830	10.320	0.972	2.589	0.123	3.415	0.144	0.623	0.226	0.536
1840	12.446	1.074	3.103	0.147	4.191	0.175	0.711	0.256	0.602
1850	14.651	1.317	3.739	0.171	5.312	0.215	0.811	0.287	0.677
1860	17.288	2.064	4.035	0.196	5.785	0.262	0.923	0.333	0.766
1870	19.716	2.589	4.372	0.243	6.472	0.334	1.003	0.381	0.851
1880	22.475	4.069	5.344	0.311	6.893	0.404	1.137	0.456	0.950
1890	28.589	4.752	6.365	0.395	7.612	0.510	1.273	0.539	1.043
1900	35.315	6.307	7.669	0.514	8.415	0.659	1.455	0.632	1.179
1910	49.555	9.576	9.830	0.704	12.667	0.887	1.807	0.881	1.585
1920	64.528	7.746	12.244	0.770	16.756	1.179	2.044	1.188	1.721
1930	84.743	11.712	15.778	0.869	17.852	1.580	2.432	1.336	1.913
1940	90.468	14.331	22.039	1.081	19.230	2.027	3.581	1.734	2.735
1950	134.503	20.142	29.562	1.672	25.765	2.693	5.509	2.642	4.755
1960	213.774	27.057	44.283	2.389	26.016	3.893	8.615	4.180	6.759
1970	314.225	35.843	65.140	3.733	32.629	5.667	11.959	5.315	9.514
1980	529.676	37.457	82.555	5.606	44.963	9.997	22.586	6.693	13.454
1990	641.925	50.087	94.139	6.948	49.599	14.509	35.188	7.247	15.107
2000	812.214	79.527	112.383	12.222	38.447	29.575	40.986	10.364	19.766
2010	1,044.632	95.079	145.346	14.789	44.369	34.995	57.525	11.650	25.626
2020	1,121.787	108.448	171.812	15.914	34.082	42.052	52.743	11.330	35.338

	37	38	39	40	41	42	43	44	45
	Haiti	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
	LA	LA	LA	LA	LA	LA	LA	LA	LA
1820	0.468	0.172	6.550	0.321	0.001	0.453	1.768	0.368	1.138
1830	0.530	0.318	6.895	0.379	0.006	0.703	2.052	0.494	1.386
1840	0.568	0.371	7.267	0.440	0.034	0.878	2.342	0.654	1.688
1850	0.611	0.433	7.683	0.514	0.189	1.093	2.674	0.862	2.055
1860	0.681	0.476	8.510	0.548	0.247	1.155	3.127	1.544	2.491
1870	0.749	0.516	9.254	0.580	0.289	1.208	3.688	2.408	2.771
1880	0.814	0.549	10.323	0.668	0.325	1.257	4.272	3.202	3.168
1890	0.934	0.600	12.619	0.789	0.382	1.410	5.680	4.933	3.751
1900	1.062	0.669	18.093	0.907	0.456	1.628	7.021	6.959	3.943
1910	1.340	0.793	25.310	1.143	0.641	2.387	9.767	9.719	4.532
1920	1.585	0.958	26.839	1.323	0.765	2.898	11.241	10.051	21.774
1930	1.829	1.195	29.801	1.603	0.855	3.346	12.869	12.176	48.070
1940	2.213	1.841	44.247	2.058	1.169	4.533	15.077	14.548	76.184
1950	2.994	2.664	72.945	2.886	2.116	8.127	22.055	19.384	112.078
1960	3.883	4.126	114.916	4.385	3.682	12.723	31.849	25.489	141.624
1970	4.595	5.573	170.944	7.093	7.518	13.878	39.181	27.483	90.222
1980	5.772	7.781	313.923	8.270	15.000	18.559	47.484	32.984	140.947
1990	5.227	10.358	403.358	10.273	15.215	25.815	46.595	28.836	169.261
2000	7.999	11.599	484.510	12.687	18.063	25.627	59.068	31.729	217.075
2010	11.527	13.364	608.384	15.048	24.522	45.713	78.768	35.625	239.842
2020	13.108	14.952	556.663	18.125	26.996	40.506	83.764	33.484	148.415

	46	47	48	49	50	51	52	53	54
	Australia	N. Zealand	China	India	Indonesia	Japan	Malaysia	Philippines	Thailand
	O	O	As	As	As	As	As	As	As
1820	0.618	1.987	220.767	167.664	12.979	9.410	0.241	2.809	6.459
1830	1.273	2.318	237.105	172.521	14.205	9.682	0.284	3.244	6.137
1840	2.558	2.709	238.022	180.718	15.403	9.956	0.349	3.885	6.695
1850	6.129	3.892	239.130	189.389	16.630	10.294	0.429	4.639	7.267
1860	10.917	4.524	220.215	197.735	18.771	10.835	0.524	5.555	7.696
1870	15.475	5.158	209.698	205.922	20.816	11.328	0.610	6.429	8.064
1880	22.911	7.325	217.779	214.327	24.143	15.035	1.033	7.413	8.844
1890	31.871	9.591	225.618	234.174	27.740	21.028	1.158	8.307	9.521
1900	41.640	11.823	238.864	241.851	33.108	36.788	1.752	9.405	10.514
1910	56.857	17.163	262.425	237.753	40.091	63.340	2.347	11.879	12.618
1920	74.779	18.113	334.052	246.909	46.456	105.123	3.691	15.137	15.942
1930	81.726	23.101	360.380	275.114	57.145	129.097	5.994	20.512	20.916
1940	99.307	26.464	448.819	311.050	69.711	204.138	6.433	24.350	27.006
1950	136.775	32.630	482.145	325.530	74.407	169.589	8.996	33.643	40.079
1960	194.743	42.272	971.204	381.381	86.043	333.261	12.760	52.342	58.041
1970	282.530	54.659	1,412.353	426.166	103.130	903.608	20.278	73.981	80.646
1980	355.687	57.589	2,316.080	516.761	167.714	1,048.401	45.008	95.670	115.357
1990	413.695	66.227	3,489.376	685.225	262.098	1,206.070	82.321	102.552	180.646
2000	471.196	76.195	4,796.751	876.598	473.513	1,369.227	175.959	141.149	269.869
2010	510.321	76.551	10,284.870	1,149.921	671.390	1,302.179	278.658	165.039	412.542
2020	482.322	78.357	12,365.541	1,398.214	887.749	1,149.954	340.509	222.560	437.383

	55	56	57	58	59	60	61	62	63
	Iran	Iraq	Israel	S. Arabia	Syria	Turkey	Algeria	Congo R.D.	Egypt
	ME	ME	ME	ME	ME	ME	Af	Af	Af
1820	5.134	0.897		0.753	1.079	9.809	0.830	1.392	3.152
1830	5.417	0.939		0.782	1.120	10.194	0.973	1.408	3.262
1840	5.699	0.983		0.802	1.148	10.553	1.116	1.426	3.372
1850	5.991	1.033		0.847	1.178	10.898	1.267	1.449	3.538
1860	6.319	1.118		0.876	1.214	11.452	1.413	1.537	3.846
1870	6.587	1.253		0.897	1.243	12.021	1.544	1.636	4.377
1880	7.814	1.534		0.978	1.429	13.038	1.731	1.810	5.148
1890	8.797	1.744		1.021	1.578	13.802	1.899	1.956	6.427
1900	9.525	1.950		1.063	1.542	14.496	2.059	2.125	7.582
1910	9.983	2.261		1.060	1.315	16.024	2.238	2.338	8.626
1920	12.749	2.528		1.054	1.110	16.909	3.403	2.883	10.161
1930	14.760	3.765		1.135	1.026	22.108	5.646	4.464	12.676
1940	20.491	21.409		7.593	1.386	30.858	6.533	8.037	15.076
1950	21.636	22.713	4.488	29.324	2.870	44.887	23.042	20.001	24.053
1960	80.157	43.160	9.609	38.715	7.332	66.038	34.913	34.923	26.097
1970	150.723	76.258	18.682	86.373	13.673	95.212	41.084	57.802	31.543
1980	158.225	121.737	28.176	157.801	27.396	141.941	87.768	47.434	46.698
1990	292.860	135.042	40.745	273.828	58.305	205.940	135.618	58.376	70.855
2000	458.249	133.407	70.965	384.316	77.790	274.438	147.982	59.236	108.766
2010	707.444	174.724	85.145	643.140	83.722	370.225	174.136	62.752	152.631
2020	902.701	272.144	82.769	778.345	36.176	476.087	218.822	76.137	171.179

	64	65	66	67	68	69	70	71	72	
	Eritrea & Ethiopia	Libya	Malawi	Morocco	Nigeria	South Africa	Tunisia	Zambia	Zimbabwe	TOTAL
	Af	Af	Af	Af	Af	Af	Af	Af	Af	
1820	3.808	0.257	0.334	1.739	4.430	1.601	0.366	1.002	0.357	959.795
1830	5.385	0.260	0.338	2.050	4.519	1.783	0.386	1.014	0.419	1,064.424
1840	6.964	0.263	0.342	2.358	4.582	1.981	0.405	1.025	0.492	1,197.838
1850	8.793	0.295	0.348	2.660	4.712	2.214	0.480	1.033	0.585	1,371.943
1860	10.319	0.304	0.357	2.979	4.860	2.866	0.515	1.116	0.686	1,606.326
1870	11.772	0.310	0.374	3.260	5.002	3.374	0.597	1.140	0.798	1,893.850
1880	13.636	0.337	0.414	3.716	5.436	5.217	0.716	1.530	0.958	2,395.903
1890	15.248	0.350	0.437	4.045	5.679	6.181	0.824	1.678	1.124	3,047.479
1900	16.946	0.396	0.466	4.401	5.960	9.450	0.948	1.834	1.323	3,919.519
1910	18.671	0.424	0.526	4.757	6.620	23.634	1.115	2.063	1.961	5,256.312
1920	21.162	0.474	0.697	5.399	8.908	36.339	1.499	3.074	3.143	5,880.323
1930	23.665	0.591	0.890	6.846	11.661	43.406	2.617	4.565	4.523	6,804.434
1940	25.481	0.814	1.068	7.624	13.577	69.667	3.082	6.113	5.788	7,915.048
1950	39.057	6.800	2.025	13.460	28.081	123.083	4.977	18.788	8.986	9,682.822
1960	40.545	18.647	2.185	15.191	52.625	170.824	5.596	19.191	15.886	13,924.982
1970	45.072	88.021	3.069	21.914	141.803	226.208	9.656	29.974	18.071	20,130.068
1980	47.937	76.636	4.341	28.960	210.569	294.158	16.832	25.985	17.624	25,292.892
1990	56.280	78.849	5.791	36.267	233.480	383.004	22.140	29.115	26.652	28,286.590
2000	82.770	75.277	6.661	53.598	332.881	437.338	31.348	26.649	26.354	30,238.632
2010	104.587	98.603	10.067	86.168	296.844	526.615	33.074	32.933	22.587	37,407.326
2020	131.442	55.029	16.308	94.348	372.874	487.597	39.391	39.694	20.235	39,069.037