

# 20. La situation énergétique mondiale

## 20.2 – IEA Key world energy statistics

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Key world  
energy statistics

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**2021**

# Plan de la présentation

- Introduction et objectifs
- Supply, transformation, consommation, balances, facteurs de conversion
- Conclusion

# Plan de la présentation

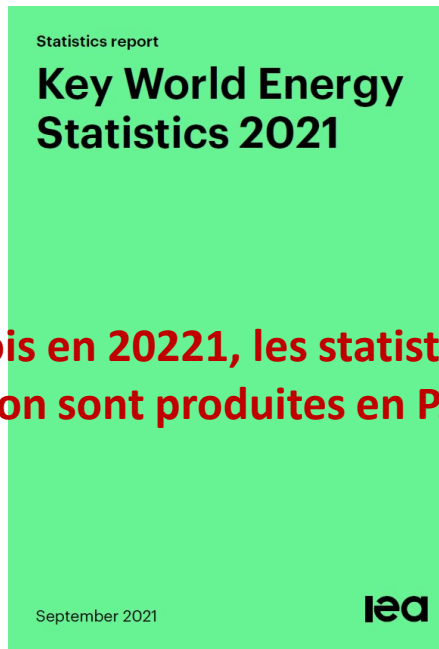
- ***Introduction et objectifs de la capsule***
- Supply, transformation, final consumption, balances, émissions, R&D, indicateurs, facteurs de conversion, glossaire
- Conclusion

# Introduction et objectifs

- L'IEA propose chaque mois de septembre ses statistiques.
- Ces statistiques concernent pour certaines une revue de l'année qui précède et d'autres de deux années antérieures.
- Cette présentation est mise à jour chaque année au **début de décembre** pour le cours de l'hiver, de l'été et de l'automne suivant.
- Cette présentation doit être considérée comme complémentaire au document produit par IEA : une version PDF disponible pour ordinateur ou téléphone.

# Introduction et objectifs

- Cette présentation est tronquée par rapport au document PDF.
- Les éléments du document complet sont susceptibles de devenir des questions de test, de quiz ou d'examen.



**Pour la première fois en 20221, les statistiques de production et de consommation sont produites en PJ plutôt qu'en MTep**

# Introduction et objectifs

- Objectifs de cette présentation
  - Comprendre où en est l'humanité en termes de production et de consommation énergétique;
  - Permettre une réflexion sur notre avenir;
  - Permettre une comparaison avec les statistiques de BP.

# Question

- Combien d'énergie produit/consomme-t-on d'énergie primaire? (Avez-vous consulté 20.1 ou les IEA Stats?)
  - A. 100 à 200 EJ
  - B. 200 à 300 EJ
  - C. 300 à 400 EJ
  - D. 400 à 500 EJ
  - E. 500 à 600 EJ

# Plan de la présentation

- Introduction et objectifs de la capsule
- ***Supply, transformation, final consumption, balances, émissions, R&D, indicateurs, facteurs de conversion, glossaire***
- Conclusion

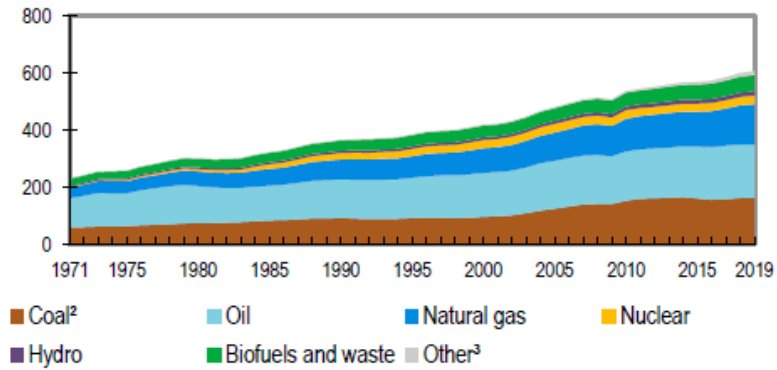


# Question

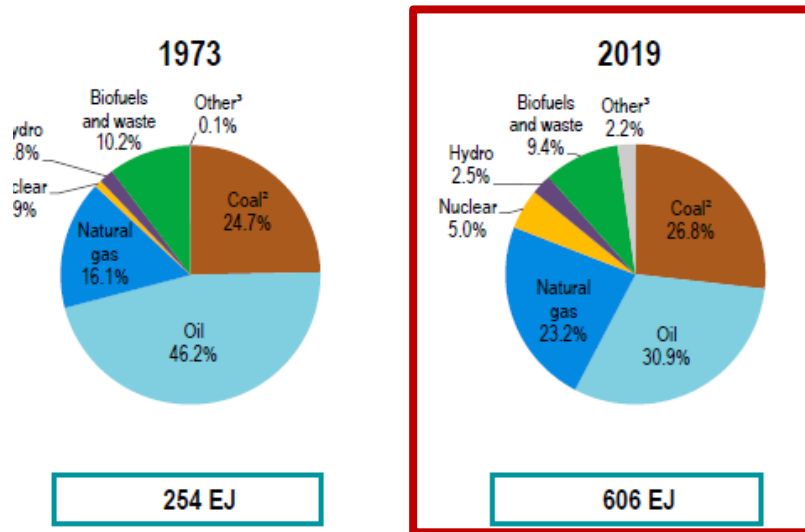
- Combien représente le trio fossile en % dans la production?
  - A. 0 à 20 %
  - B. 20 à 40 %
  - C. 40 à 60 %
  - D. 60 à 80 %
  - E. 80 et + %

## World total energy supply (TES) by source

World<sup>1</sup> total energy supply by source, 1971-2019 (EJ)

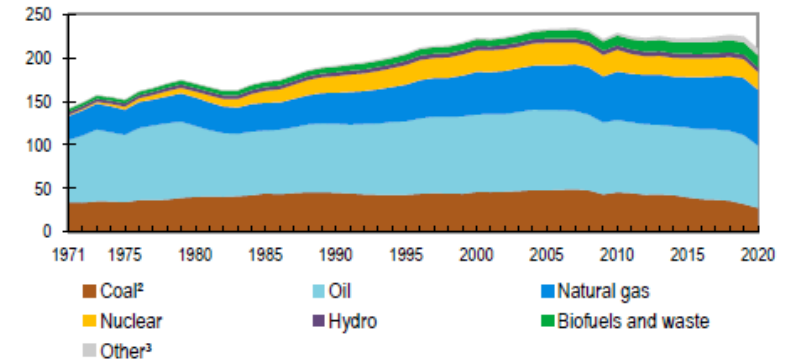


Share of world total energy supply by source, 1973 and 2019

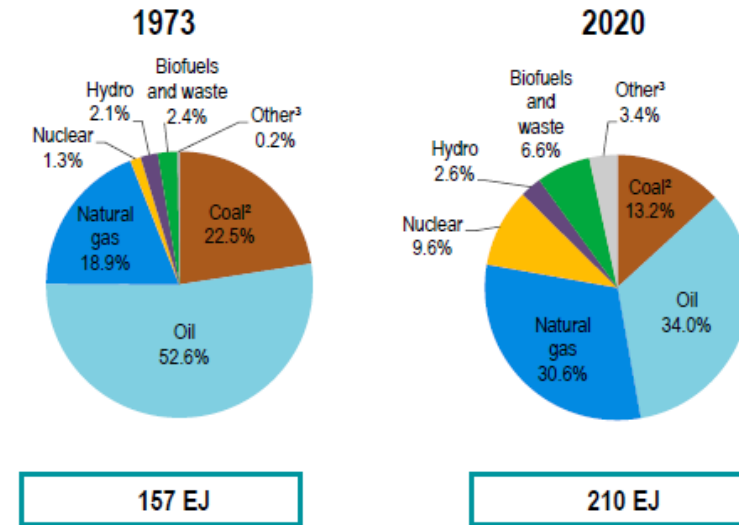


## OECD total energy supply by source

OECD total energy supply<sup>1</sup> by source, 1971-2020 (EJ)

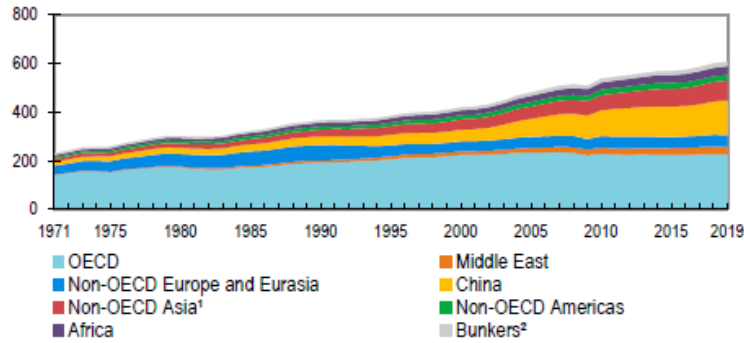


Share of OECD total energy supply<sup>1</sup> by source, 1973 and 2020

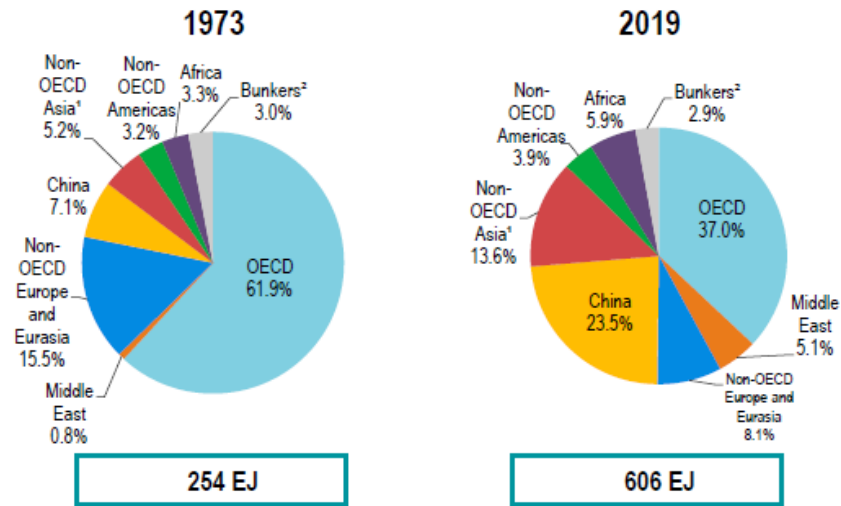


## World total energy supply by region

World total energy supply by region, 1971-2019 (EJ)

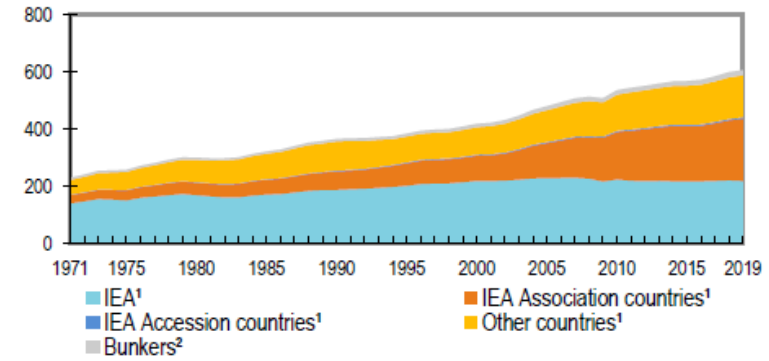


Share of world total energy supply by region, 1973 and 2019

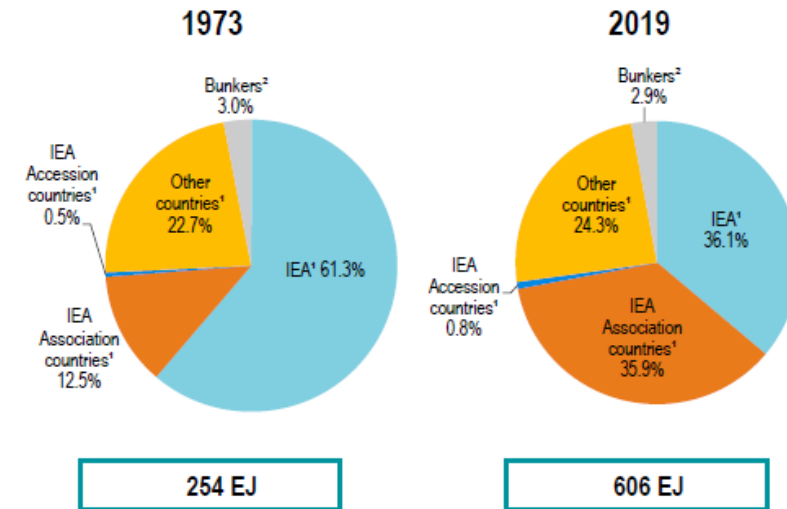


## World total energy supply by region

World total energy supply by IEA aggregate, 1971-2019 (EJ)

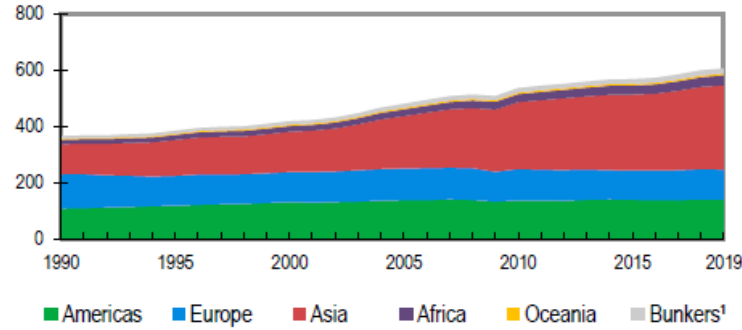


Share of world total energy supply by IEA aggregate, 1973 and 2019

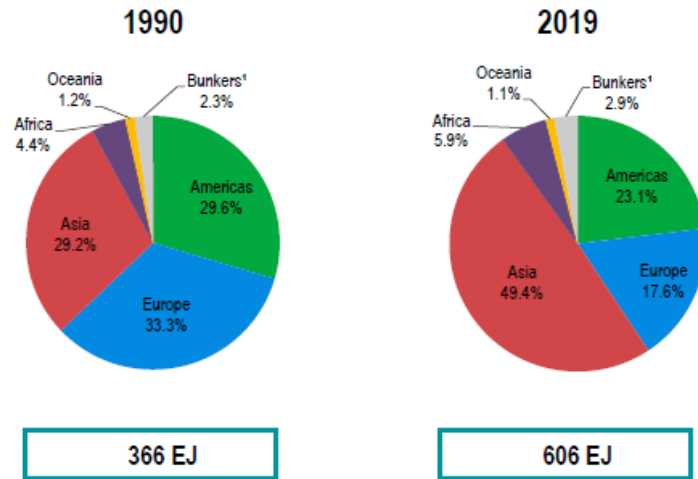


## World total energy supply by geographical region

World total energy supply by geographical region, 1990-2019 (EJ)

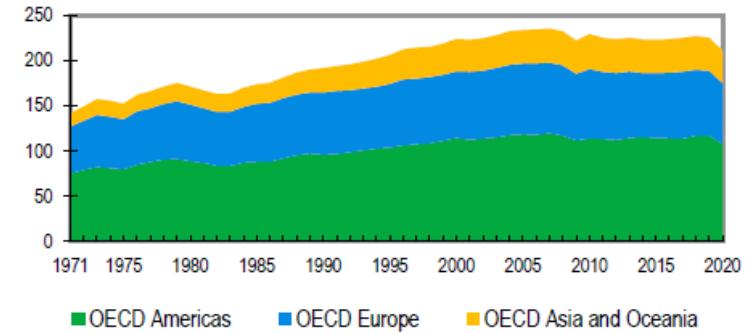


Share of world total energy supply by geographical region, 1990 and 2019

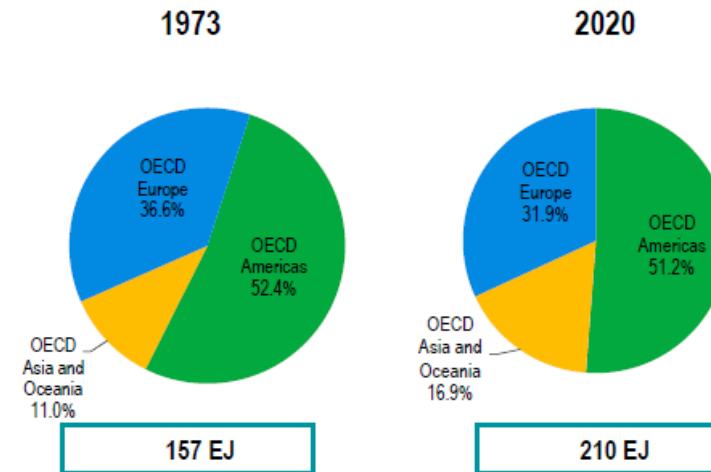


## OECD total energy supply by region

OECD total energy supply<sup>1</sup> by region, 1971-2020 (EJ)

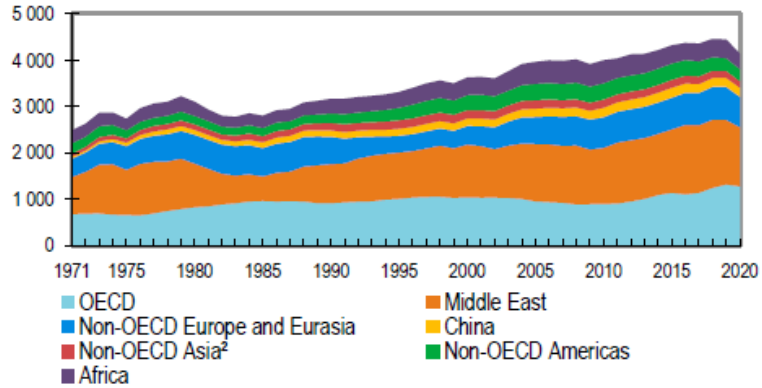


Share of OECD total energy supply<sup>1</sup> by region, 1973 and 2020

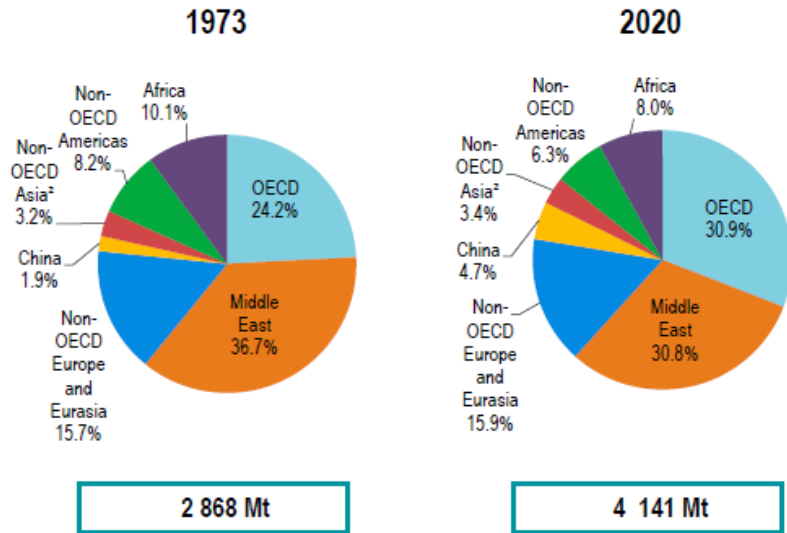


# Crude oil production

World crude oil<sup>1</sup> production by region, 1971-2020 (Mt)



Share of world crude oil<sup>1</sup> production by region, 1973 and 2020



# Crude oil production

Producers, net exporters and net importers of crude oil<sup>1</sup>

Producers	Mt	% of world total
United States	706	17.0
Russian Federation	512	12.4
Saudi Arabia	511	12.3
Canada	255	6.2
Iraq	201	4.9
People's Rep. of China	195	4.7
United Arab Emirates	174	4.2
Brazil	153	3.7
Kuwait	131	3.2
Islamic Rep. of Iran	130	3.1
Rest of the world	1 173	28.3
<b>World</b>	<b>4 141</b>	<b>100.0</b>

2020 provisional data

Net exporters	Mt
Saudi Arabia	352
Russian Federation	239
Iraq	125
Canada	154
United Arab Emirates	148
Kuwait	102
Nigeria	99
Kazakhstan	70
Angola	63
Mexico	59
Others	531
<b>Total</b>	<b>2 042</b>

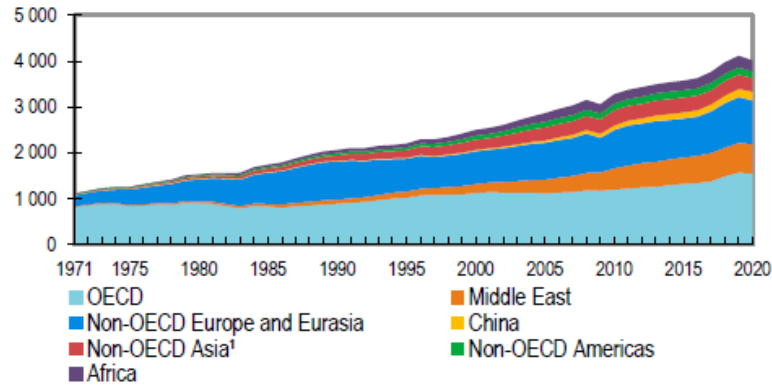
2019 data

Net importers	Mt
People's Rep. of China	505
India	227
United States	202
Japan	149
Korea	145
Germany	86
Spain	66
Italy	65
Netherlands	62
Singapore	53
Others	509
<b>Total</b>	<b>2 069</b>

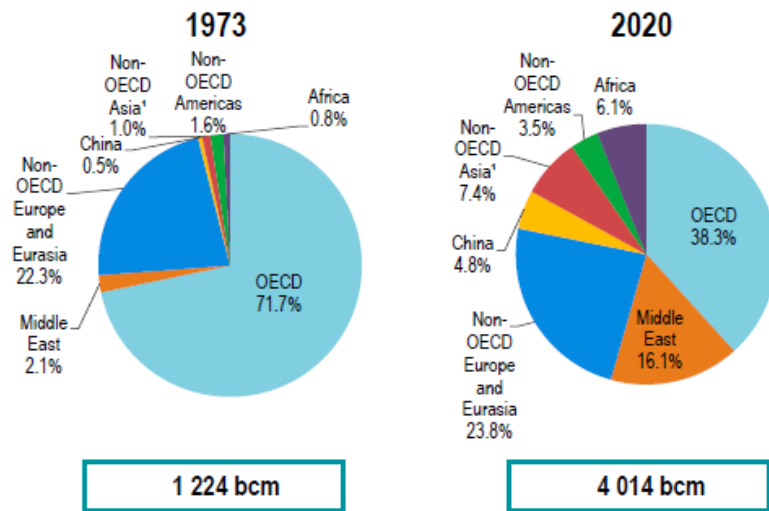
2019 data

## Natural gas production

World natural gas production by region, 1971-2020  
(billion cubic metres, bcm)



Share of world natural gas production by region, 1973 and 2020



## Natural gas production

Producers, net exporters and net importers<sup>1</sup> of natural gas

Producers	bcm	% of world total
United States	949	23.6
Russian Federation	722	18.0
Islamic Rep. of Iran	235	5.9
People's Rep. of China	191	4.8
Canada	184	4.6
Qatar	167	4.2
Australia	148	3.7
Norway	116	2.9
Saudi Arabia	99	2.5
Algeria	92	2.3
Rest of the world	1 111	27.5
<b>World</b>	<b>4 014</b>	<b>100.0</b>

2020 provisional data

Net exporters	bcm
Russian Federation	230
Qatar	121
Norway	111
Australia	103
United States	77
Turkmenistan	56
Canada	47
Algeria	41
Nigeria	27
Malaysia	22
Others	176
<b>Total</b>	<b>1 017</b>

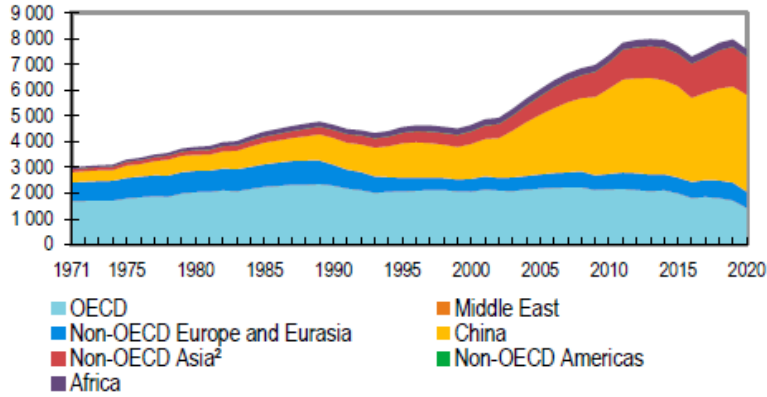
2020 provisional data

Net importers	bcm
People's Rep. of China	125
Japan	105
Germany	83
Italy	66
Mexico	64
Korea	54
Turkey	47
France	37
United Kingdom	34
India	34
Others	324
<b>Total</b>	<b>973</b>

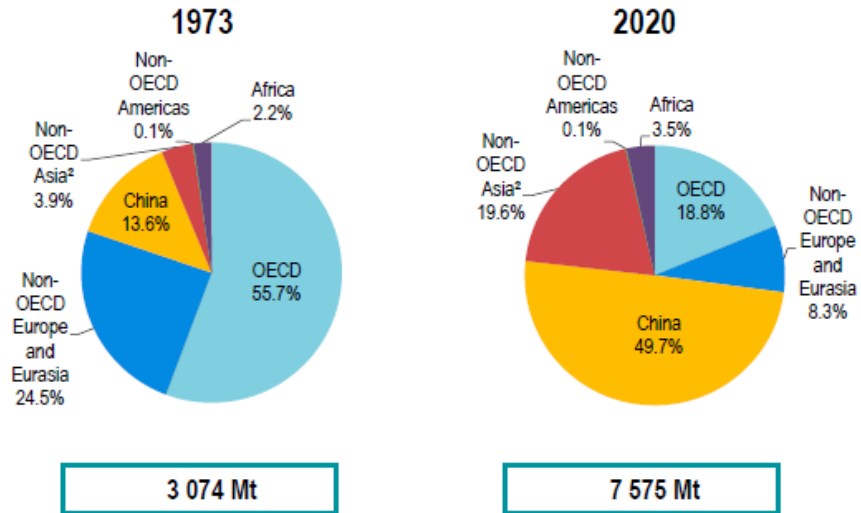
2020 provisional data

## Coal production

World coal<sup>1</sup> production by region, 1971-2020 (Mt)



Share of world coal<sup>1</sup> production by region, 1973 and 2020



## Coal production

Producers, net exporters and net importers of coal<sup>1</sup>

Producers	Mt	% of world total
People's Rep. of China	3 764	49.7
India	760	10.0
Indonesia	564	7.4
Australia	493	6.5
United States	485	6.4
Russian Federation	398	5.3
South Africa	247	3.3
Germany	107	1.4
Poland	101	1.3
Kazakhstan	100	1.3
Rest of the world	556	7.4
<b>World</b>	<b>7 575</b>	<b>100.0</b>

2020 provisional data

Net exporters	Mt
Indonesia	396
Australia	390
Russian Federation	188
South Africa	62
United States	58
Colombia	30
Mongolia	29
Canada 	26
Kazakhstan	24
Mozambique	7
Others	2
<b>Total</b>	<b>1 212</b>

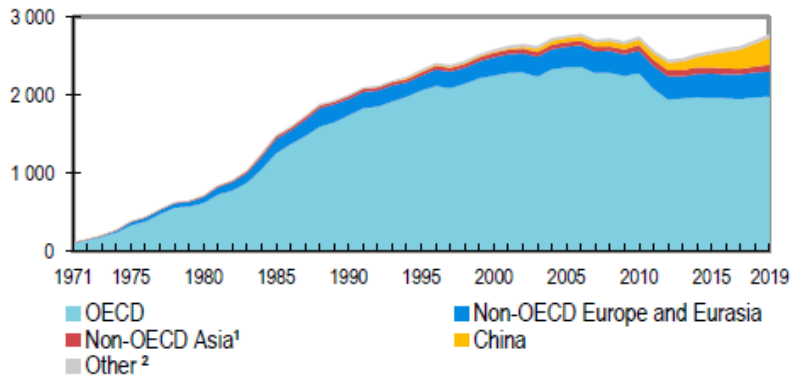
2020 provisional data

Net importers	Mt
People's Rep. of China	306
India	210
Japan	183
Korea	123
Chinese Taipei	63
Viet Nam	52
Turkey	40
Malaysia	31
Germany	29
Thailand	25
Others	202
<b>Total</b>	<b>1 264</b>

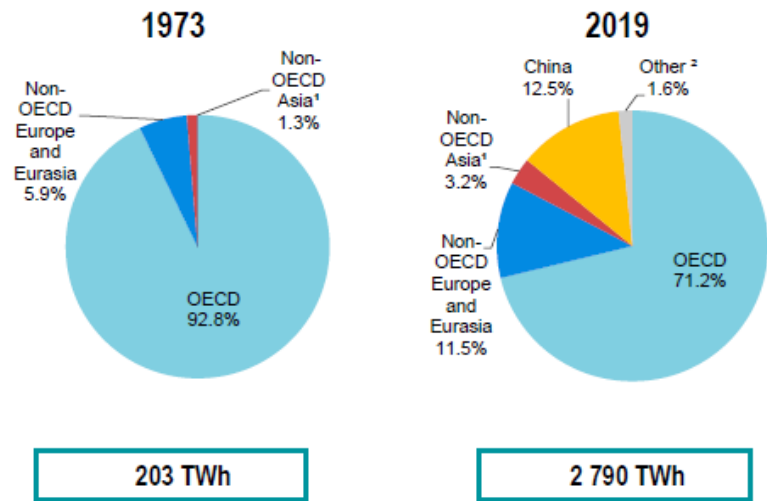
2020 provisional data

# Nuclear electricity production

World nuclear electricity production by region, 1971-2019 (TWh)



Share of world nuclear electricity production by region, 1973 and 2019



# Nuclear electricity production

Producers of nuclear electricity

Producers	TWh	% of world total
United States	843	30.2
France	399	14.3
People's Rep. of China	348	12.5
Russian Federation	209	7.5
Korea	146	5.2
Canada 🇨🇦 🇨🇦	101	3.6
Ukraine	83	3.0
Germany	75	2.7
Sweden	66	2.4
Japan	64	2.3
Rest of the world	456	16.3
<b>World</b>	<b>2 790</b>	<b>100.0</b>

2019 data

Net installed capacity	GW
United States	97
France	61
People's Rep. of China	48
Japan	32
Russian Federation	29
Korea	23
Canada 🇨🇦 🇨🇦	14
Ukraine	13
United Kingdom	9
Germany	8
Rest of the world	60
<b>World</b>	<b>393</b>

2020 data

Source: International Atomic Energy Agency

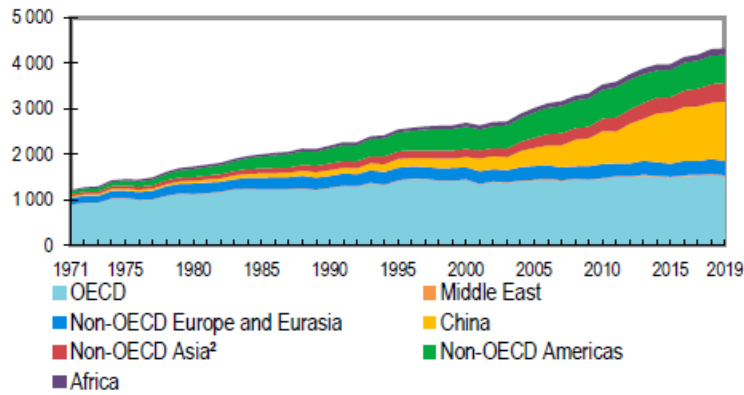
Country (top-ten producers)	% of nuclear in total domestic electricity generation
France	69.9
Ukraine	53.9
Sweden	39.3
Korea	25.1
United States	19.2
Russian Federation	18.6
Canada 🇨🇦 🇨🇦	15.7
Germany	12.3
Japan	6.1
People's Rep. of China	4.6
Rest of the world <sup>1</sup>	9.1
<b>World</b>	<b>10.3</b>

2019 data

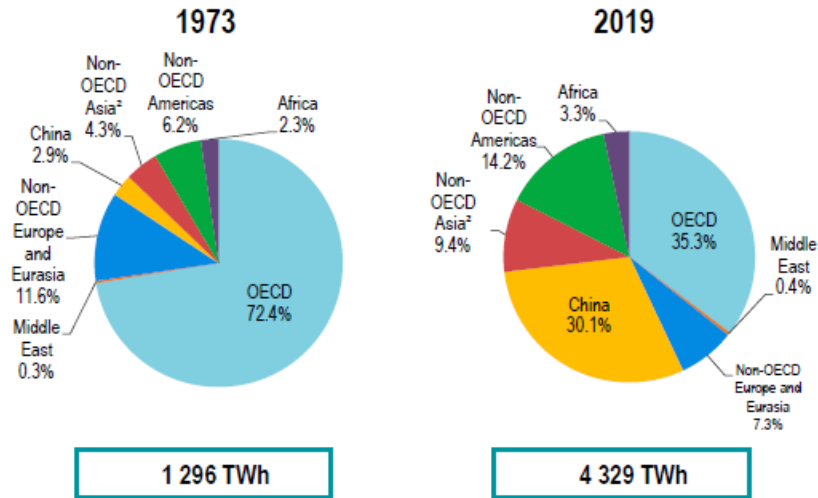


## Hydroelectricity production

World hydroelectricity production<sup>1</sup> by region, 1971-2019 (TWh)



Share of world hydroelectricity production<sup>1</sup> by region, 1973 and 2019



## Hydroelectricity production

Producers of hydroelectricity<sup>1</sup>

Producers	TWh	% of world total
People's Rep. of China	1 304	30.1
Brazil	398	9.2
Canada 🇨🇦	380	8.8
United States	311	7.2
Russian Federation	197	4.5
India	172	4.0
Norway	126	2.9
Turkey	89	2.1
Japan	87	2.0
Viet Nam	66	1.5
Rest of the world	1 199	27.7
<b>World</b>	<b>4 329</b>	<b>100.0</b>

2019 data

Net installed capacity	GW
People's Rep. of China	356
Brazil	110
United States	103
Canada 🇨🇦	81
Russian Federation	54
Japan	50
India	49
Norway	33
Turkey	29
France	26
Rest of the world	417
<b>World</b>	<b>1 308</b>

2019 data

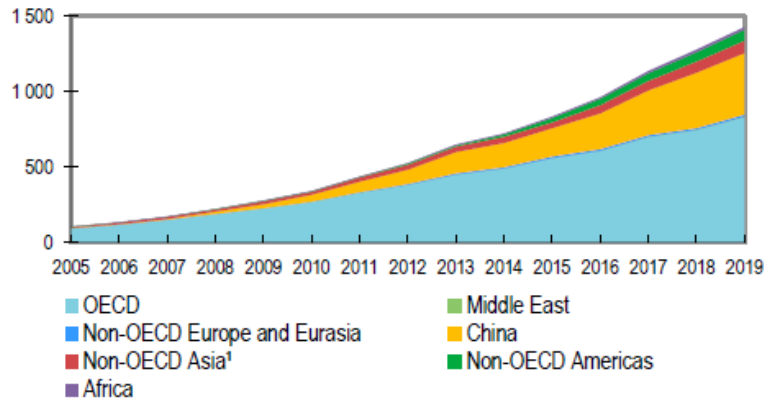
Sources:  
IEA, Renewable Energy Market Update;  
United Nations Statistics Division.

Country (top-ten producers)	% of hydro in total domestic electricity generation
Norway	93.4
Brazil	63.5
Canada 🇨🇦	58.8
Turkey	29.2
Viet Nam	27.8
Russian Federation	17.5
People's Rep. of China	17.4
India	10.6
Japan	8.4
United States	7.1
Rest of the world <sup>2</sup>	14.2
<b>World</b>	<b>16.0</b>

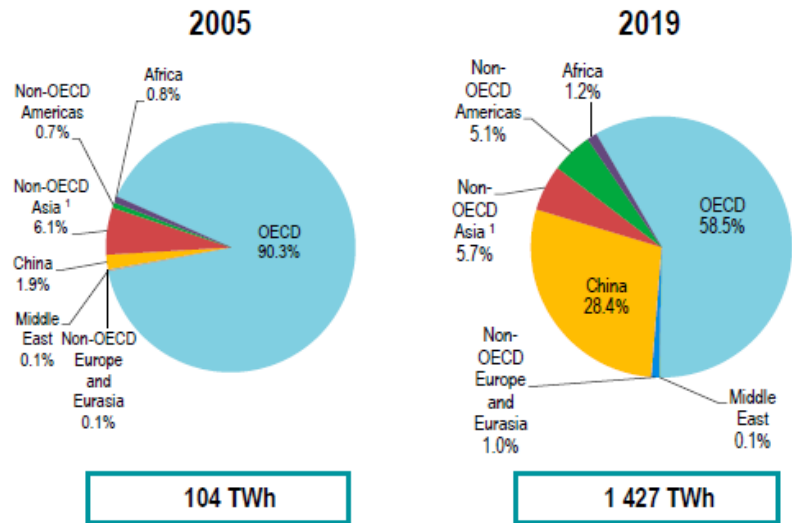
2019 data

# Wind electricity production

World wind electricity production by region, 2005-2019 (TWh)



Share of world wind electricity production by region, 2005 and 2019



# Wind electricity production

Producers of wind electricity

Producers	TWh	% of world total
People's Rep. of China	406	28.4
United States	298	20.9
Germany	126	8.8
India	70	4.9
United Kingdom	64	4.5
Brazil	56	3.9
Spain	56	3.9
France	35	2.4
Canada 🇨🇦	33	2.3
Turkey	22	1.5
Rest of the world	262	18.5
<b>World</b>	<b>1 427</b>	<b>100.0</b>

2019 data

Net installed capacity	GW
People's Rep. of China	210.3
United States	103.7
Germany	60.9
India	37.7
Spain	25.5
United Kingdom	24.0
France	16.3
Brazil	15.4
Canada 🇨🇦	13.4
Italy	10.7
Rest of the world	105.1
<b>World</b>	<b>622.9</b>

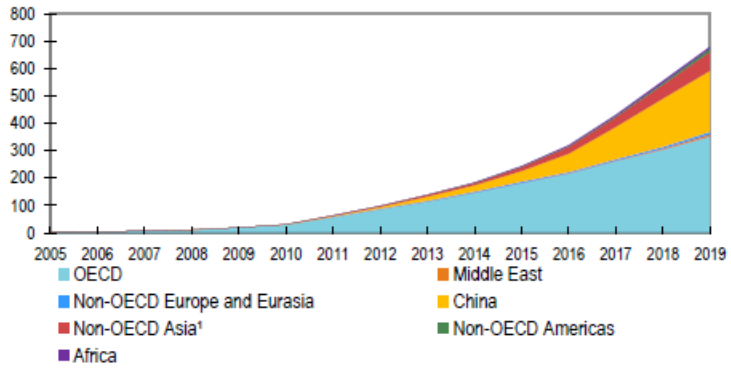
2019 data

Country (top-ten producers)	% of wind in total domestic electricity generation
Germany	20.7
Spain	20.4
United Kingdom	19.9
Brazil	8.9
Turkey	7.2
United States	6.8
France	6.1
People's Rep. of China	5.4
Canada 🇨🇦	5.1
India	4.3
Rest of the world¹	3.0
<b>World</b>	<b>5.3</b>

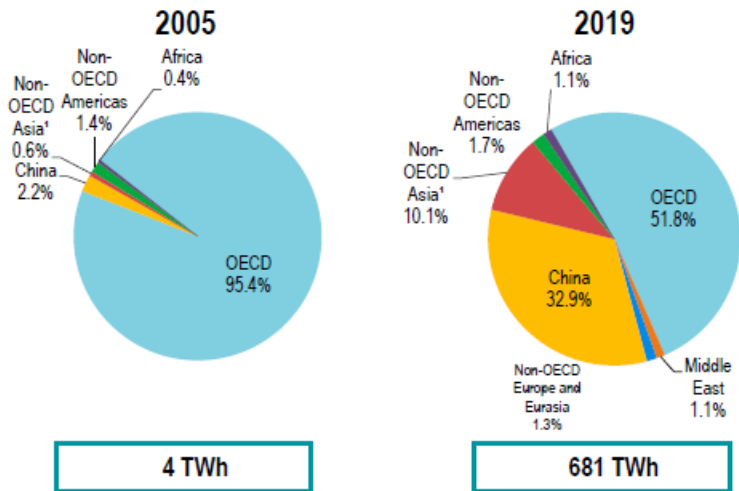
2019 data

## Solar photovoltaic electricity production

World solar PV electricity production by region, 2005-2019 (TWh)



Share of world solar PV electricity production by region, 2005 and 2019



## Solar photovoltaic electricity production

Producers of solar PV electricity

Producers	TWh	% of world total
People's Rep. of China	224	32.9
United States	94	13.8
Japan	69	10.1
India	51	7.4
Germany	46	6.8
Italy	24	3.5
Australia	15	2.2
Korea	13	1.9
United Kingdom	13	1.9
France	12	1.8
Rest of the world	120	17.7
<b>World</b>	<b>681</b>	<b>100.0</b>

2019 data

Net installed capacity	GW
People's Rep. of China	205.2
United States	75.7
Japan	63.1
Germany	49.2
India	37.6
Italy	20.9
Australia	15.9
United Kingdom	13.6
Korea	11.2
France	10.5
Rest of the world	99.7
<b>World</b>	<b>602.6</b>

2019 data

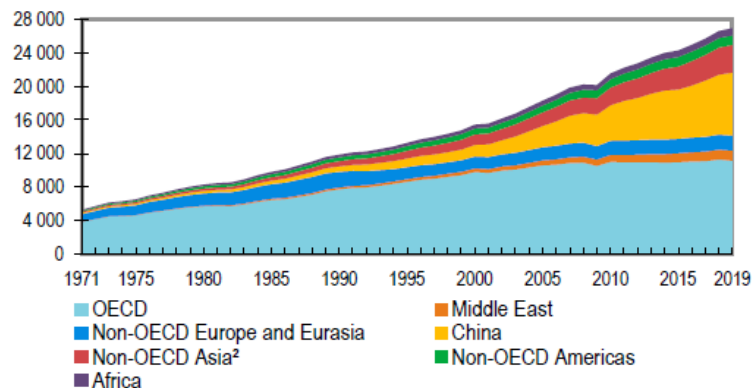
Country (top-ten producers)	% of solar PV in total domestic electricity generation
Italy	8.1
Germany	7.6
Japan	6.6
Australia	5.6
United Kingdom	4.0
India	3.1
People's Rep. of China	3.0
Korea	2.2
United States	2.1
France	2.1
Rest of the world <sup>1</sup>	1.3
<b>World</b>	<b>2.5</b>

2019 data

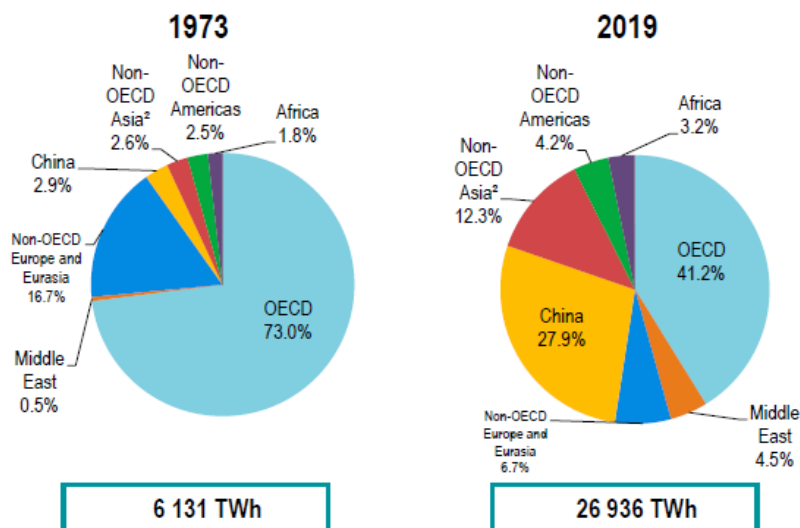


## Electricity generation by region

World electricity generation<sup>1</sup> by region, 1971-2019 (TWh)



Share of world electricity generation<sup>1</sup> by region, 1973 and 2019



## Electricity generation by region

Producers, net exporters and net importers of electricity

Producers <sup>1</sup>	TWh	% of world total
People's Rep. of China	7 472	27.7
United States	4 371	16.2
India	1 624	6.0
Russian Federation	1 120	4.2
Japan	1 037	3.8
Canada 🇨🇦	645	2.4
Brazil	626	2.3
Germany	603	2.2
Korea	578	2.1
France	566	2.1
Rest of the world	8 294	31.0
<b>World</b>	<b>26 936</b>	<b>100.0</b>

2019 data

Net exporters	TWh
France	58
Canada 🇨🇦	47
Germany	33
Paraguay	32
Sweden	26
Lao People's Dem. Rep.	23
Russian Federation	18
People's Rep. of China	17
Czech Republic	13
Israel	6
Others	63
<b>Total</b>	<b>336</b>

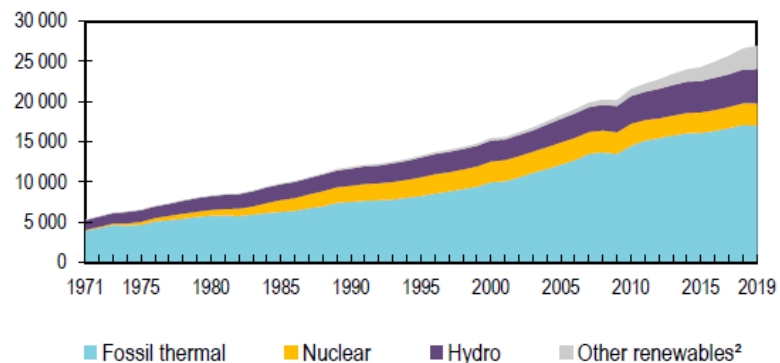
2019 data

Net importers	TWh
United States	39
Italy	38
Brazil	25
Thailand	23
United Kingdom	21
Finland	20
Iraq	14
Hungary	13
Hong Kong, China	12
Argentina	11
Others	116
<b>Total</b>	<b>332</b>

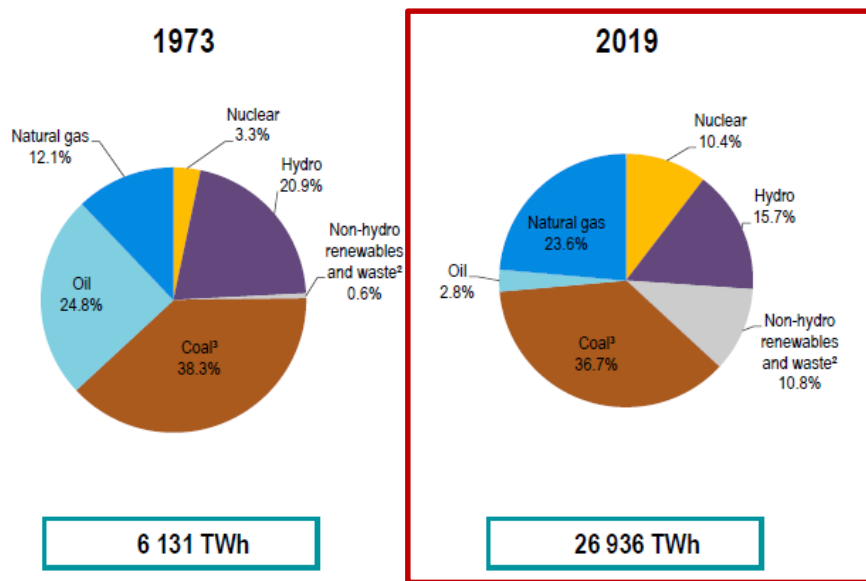
2019 data

# Electricity generation by source

World electricity generation<sup>1</sup> by source, 1971-2019 (TWh)



Share of world electricity generation<sup>1</sup> by source, 1973 and 2019



# Electricity generation by source

Producers of electricity by source

Coal <sup>1</sup>	TWh
People's Rep. of China	4 876
India	1 181
United States	1 070
Japan	329
Korea	246
South Africa	222
Russian Federation	188
Germany	182
Indonesia	174
Australia	154
Rest of the world	1 292
<b>World</b>	<b>9 914</b>

2019 data

Oil	TWh
Saudi Arabia	168
Mexico	45
Iraq	41
Japan	36
United States	36
Kuwait	28
Islamic Rep. of Iran	28
Egypt	26
Lebanon	20
Cuba	17
Rest of the world	302
<b>World</b>	<b>747</b>

2019 data

Natural gas	TWh
United States	1 640
Russian Federation	514
Japan	385
Islamic Rep. of Iran	270
Saudi Arabia	217
People's Rep. of China	213
Mexico	193
Egypt	150
Korea	146
Italy	142
Rest of the world	2 476
<b>World</b>	<b>6 346</b>

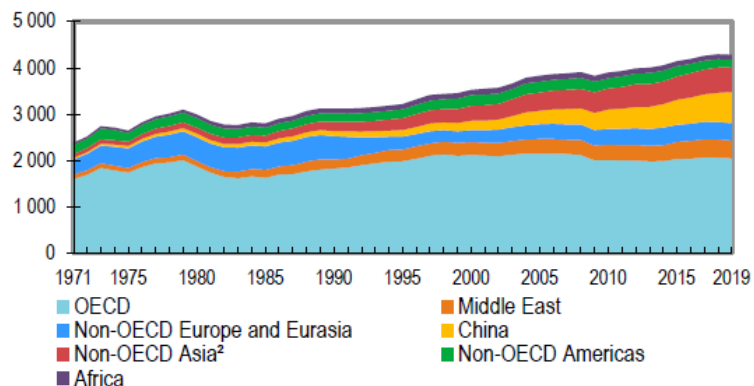
2019 data

Renewables <sup>2</sup>	TWh
People's Rep. of China	2 015
United States	767
Brazil	515
Canada 🇨🇦	427
India	325
Germany	242
Russian Federation	197
Japan	186
Turkey	132
Norway	131
Rest of the world	2 077
<b>World</b>	<b>7 014</b>

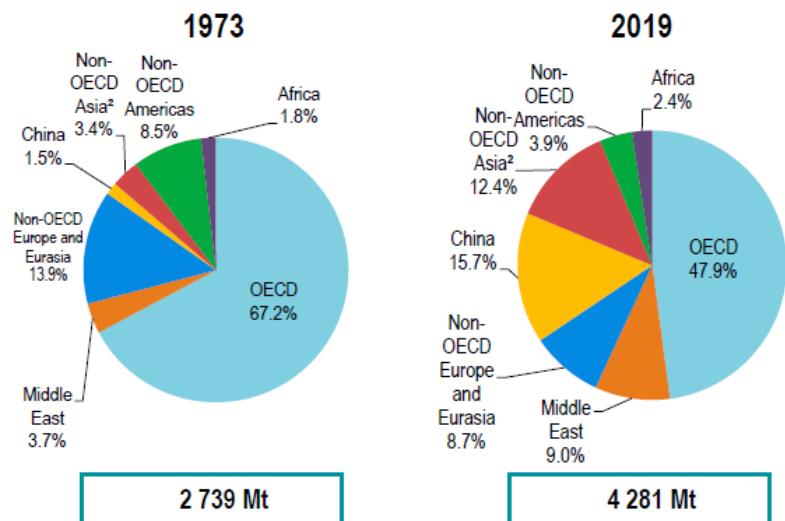
2019 data

## Refining by region

World refinery intake<sup>1</sup> by region, 1971-2019 (Mt)



Share of world refinery intake<sup>1</sup> by region, 1973 and 2019



## Refining by region

Refinery capacity, net exporters and net importers of oil<sup>1</sup>

Crude distillation capacity	kb/cd	% of world total
United States	18 384	18.0
People's Rep. of China	17 045	16.7
Russian Federation	6 819	6.7
India	5 308	5.2
Korea	3 525	3.5
Japan	3 443	3.4
Saudi Arabia	3 249	3.2
Brazil	2 229	2.2
Islamic Rep. of Iran	2 193	2.1
Germany	2 022	2.0
Rest of the world	37 875	37.0
<b>World</b>	<b>102 092</b>	<b>100.0</b>

2020 data

Net exporters	Mt
Saudi Arabia	415
Russian Federation	398
Iraq	195
United Arab Emirates	168
Canada 🇨🇦	163
Kuwait	126
Nigeria	77
Kazakhstan	74
Norway	71
Islamic Rep. of Iran	64
Others	508
<b>Total</b>	<b>2 259</b>

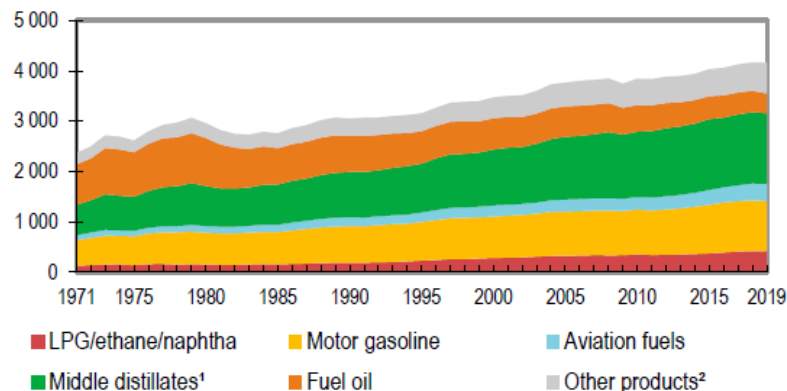
2019 data

Net importers	Mt
People's Rep. of China	497
India	202
Japan	170
Korea	117
Germany	106
Singapore	79
France	76
Spain	64
United States	63
Italy	53
Others	777
<b>Total</b>	<b>2 204</b>

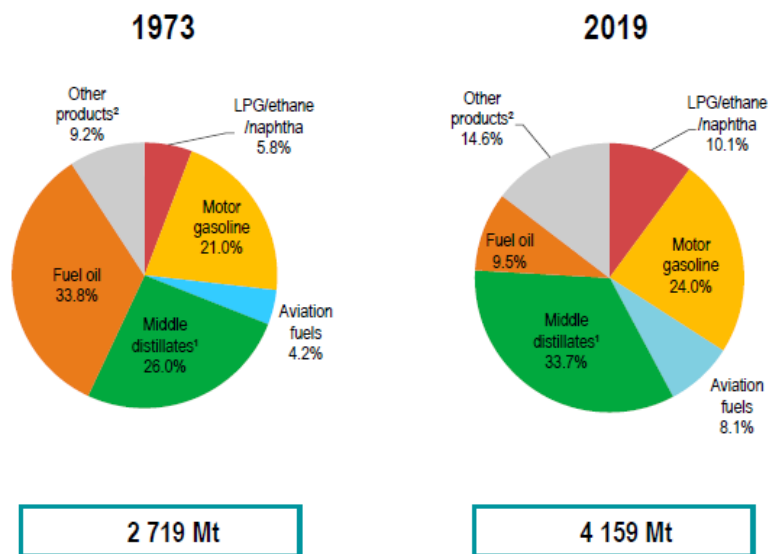
2019 data

## Refining by product

World refinery output by product, 1971-2019 (Mt)



Share of world refinery output by product, 1973 and 2019



## Refining by product

Producers, net exporters and net importers of oil products

Producers	Mt	% of world total
United States	833	20.0
People's Rep. of China	635	15.3
Russian Federation	280	6.7
India	263	6.3
Korea	158	3.8
Japan	147	3.5
Saudi Arabia	124	3.0
Canada 	99	2.4
Germany	98	2.4
Brazil	91	2.2
Rest of the world	1 431	34.4
<b>World</b>	<b>4 159</b>	<b>100.0</b>

2019 data

Net exporters	Mt
United States	139
Russian Federation	129
Saudi Arabia	63
Korea	28
India	25
Kuwait	24
Islamic Rep. of Iran	22
Netherlands	21
United Arab Emirates	20
Algeria	18
Others	149
<b>Total<sup>1</sup></b>	<b>638</b>

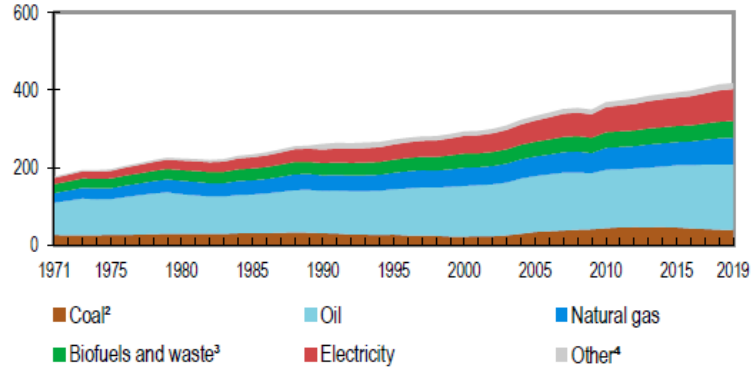
2019 data

Net importers	Mt
Mexico	47
France	28
Australia	27
Singapore	27
Nigeria	21
Japan	21
Germany	20
Hong Kong, China	20
Indonesia	20
Brazil	19
Others	306
<b>Total<sup>1</sup></b>	<b>556</b>

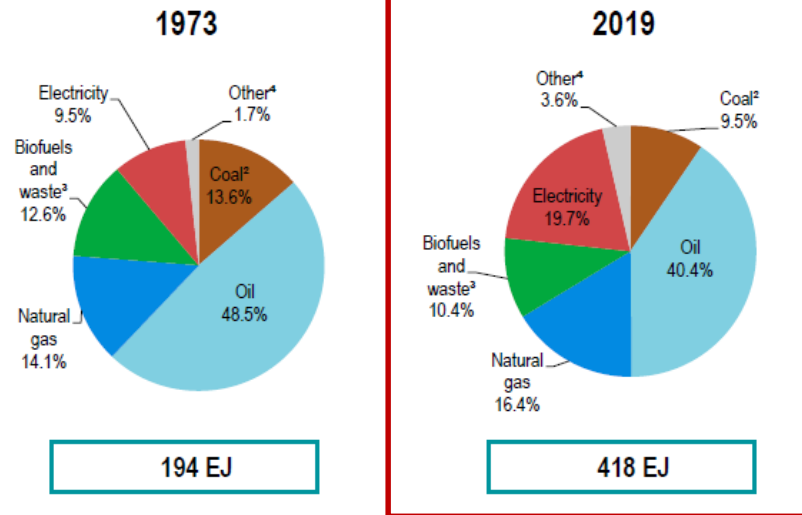
2019 data

## World total final consumption (TFC) by source

World<sup>1</sup> total final consumption by source, 1971-2019 (EJ)

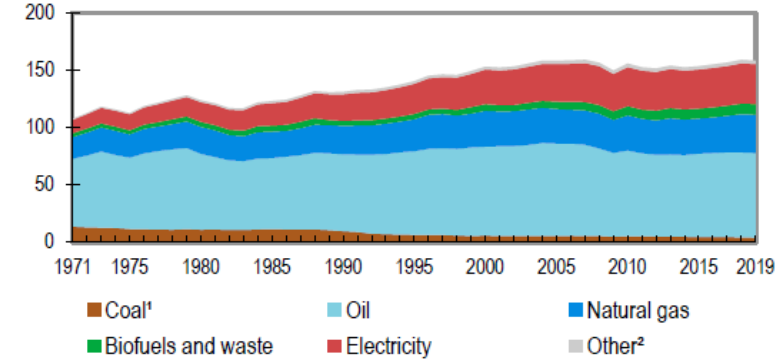


Share of world total final consumption by source, 1973 and 2019

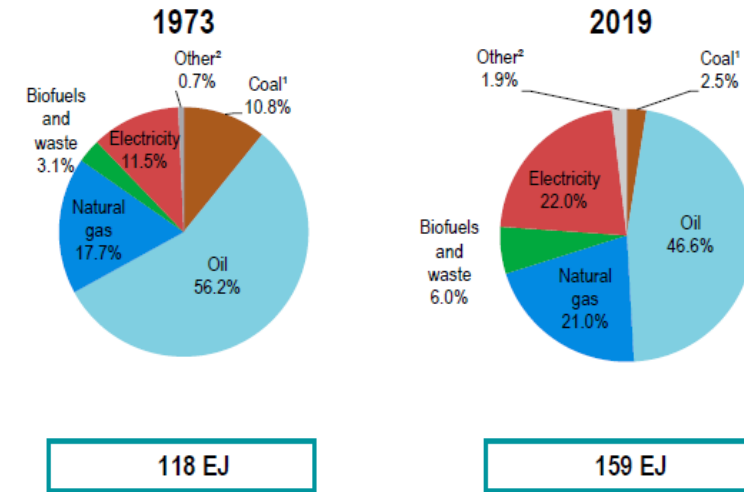


## OECD total final consumption by source

OECD total final consumption by source, 1971-2019 (EJ)



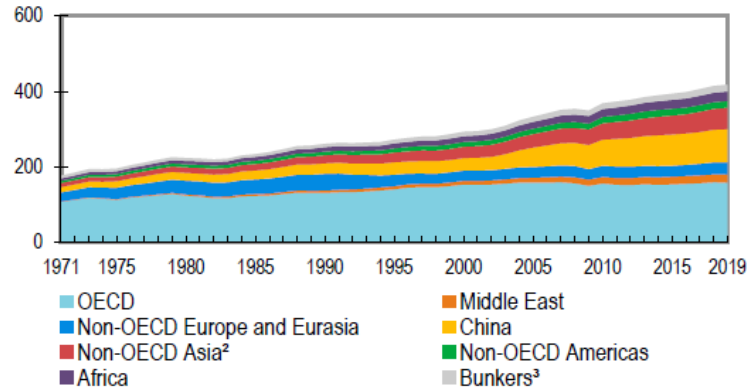
Share of OECD total final consumption by source, 1973 and 2019



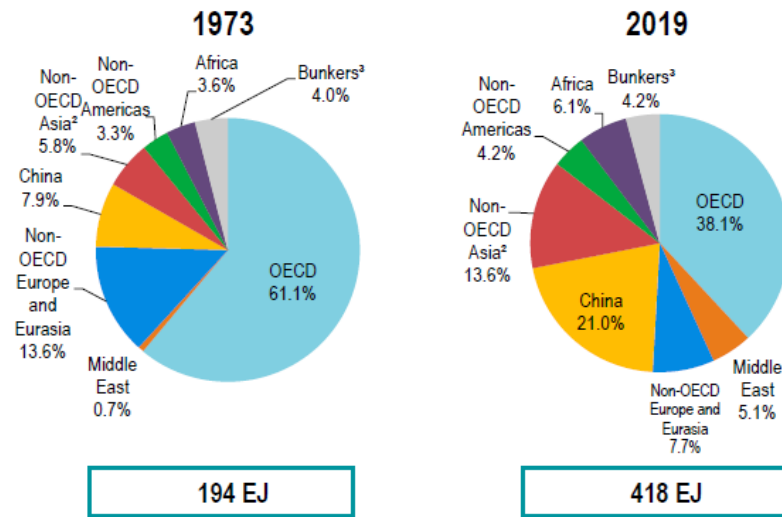


## World total final consumption by region

World total final consumption<sup>1</sup> by region, 1971-2019 (EJ)

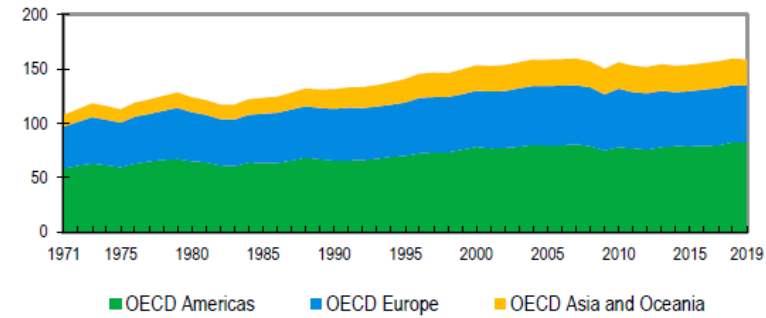


Share of world total final consumption<sup>1</sup> by region, 1973 and 2019

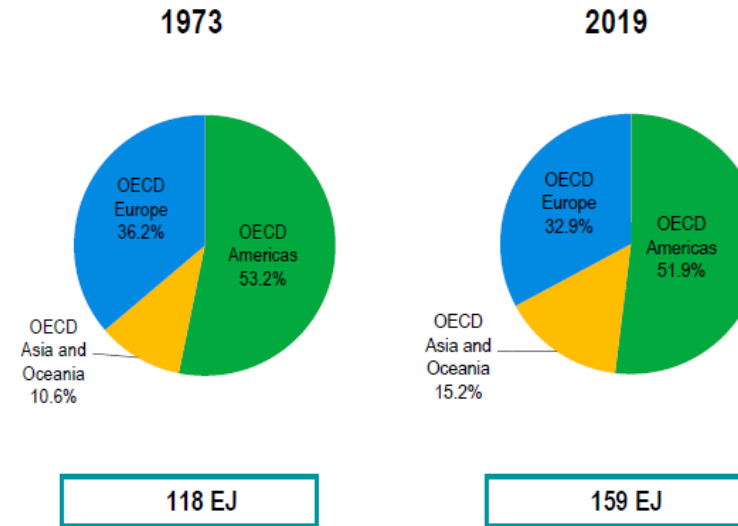


## OECD total final consumption by region

OECD total final consumption by region, 1971-2019 (EJ)

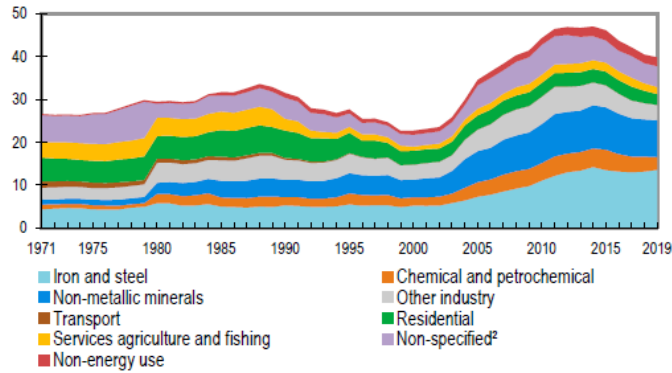


Share of OECD total final consumption by region, 1973 and 2019

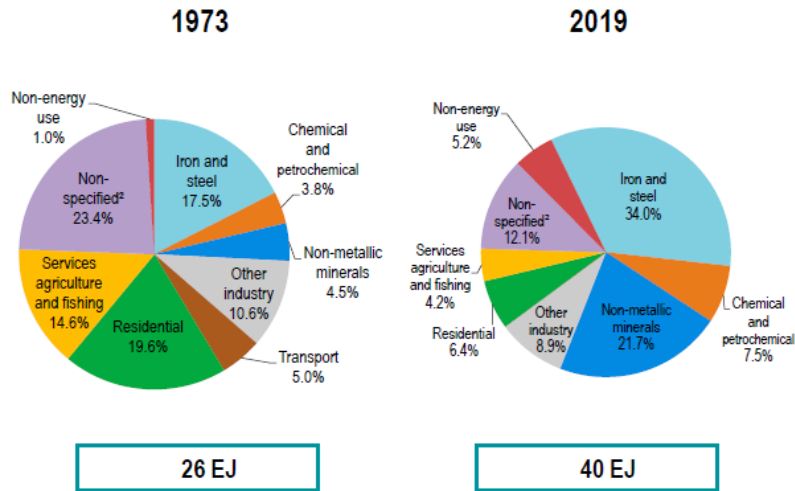


## Total final consumption by sector: coal<sup>1</sup>

Coal total final consumption by sector, 1971-2019 (EJ)

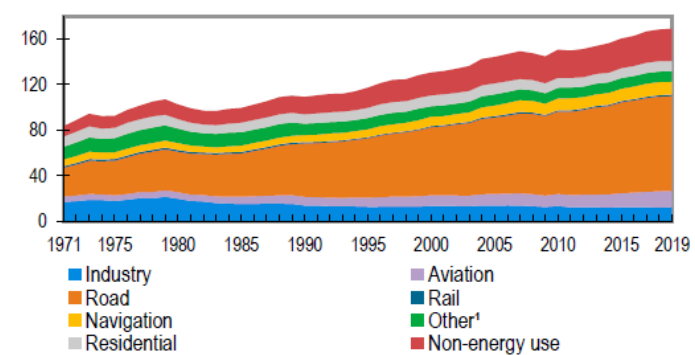


Share of coal final consumption by sector, 1973 and 2019

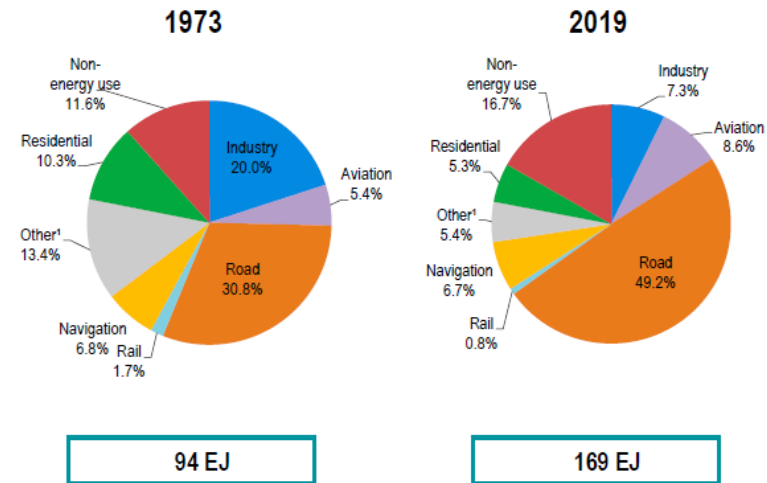


## Total final consumption by sector: oil

Oil total final consumption by sector, 1971-2019 (EJ)

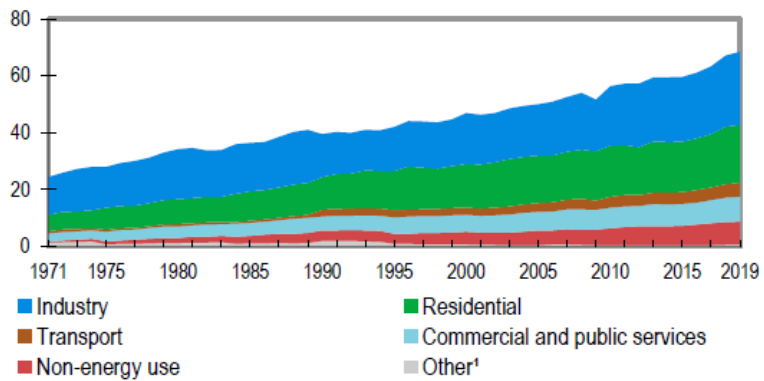


Share of oil final consumption by sector, 1973 and 2019

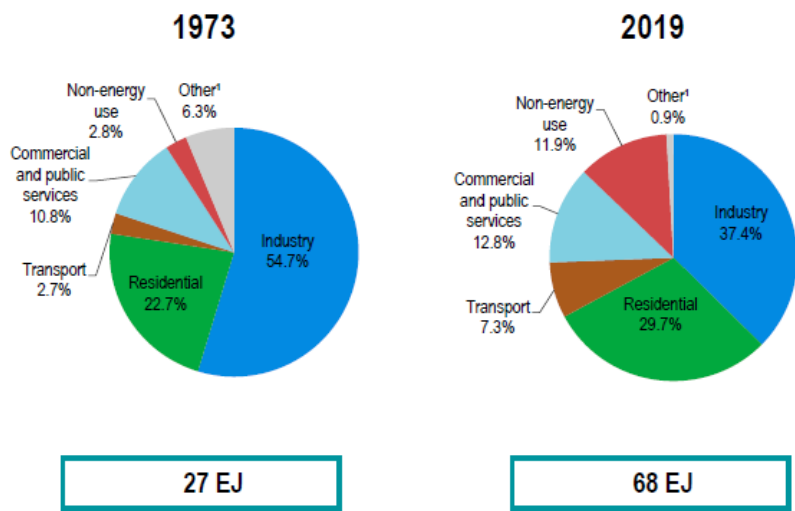


## Total final consumption by sector: natural gas

Natural gas total final consumption by sector, 1971-2019 (EJ)

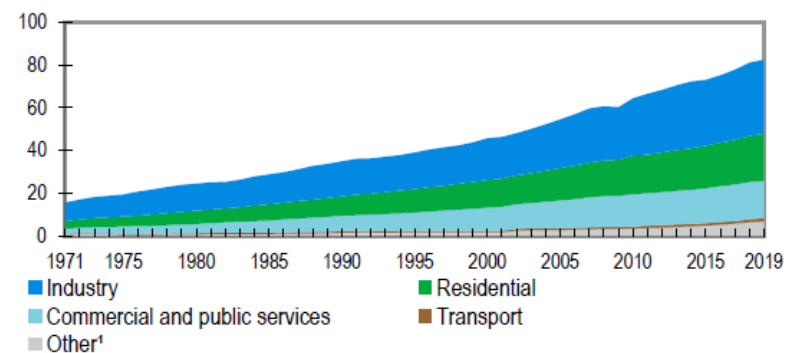


Share of natural gas final consumption by sector, 1973 and 2019

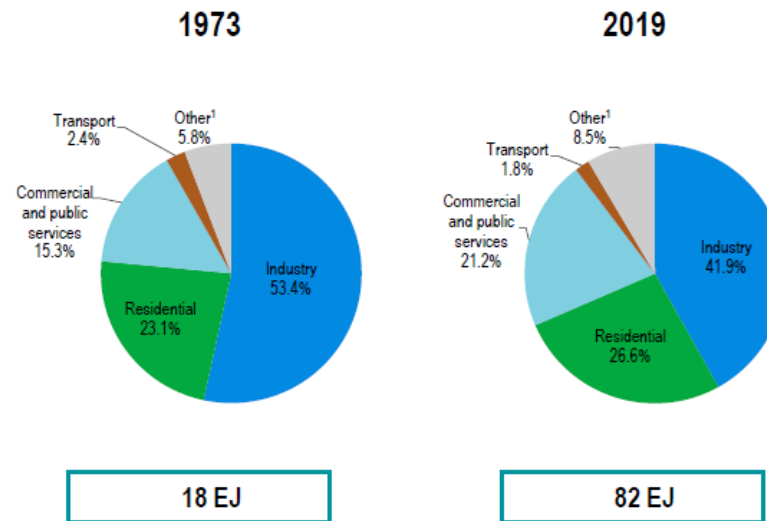


## Total final consumption by sector: electricity

Electricity total final consumption by sector, 1971-2019 (EJ)

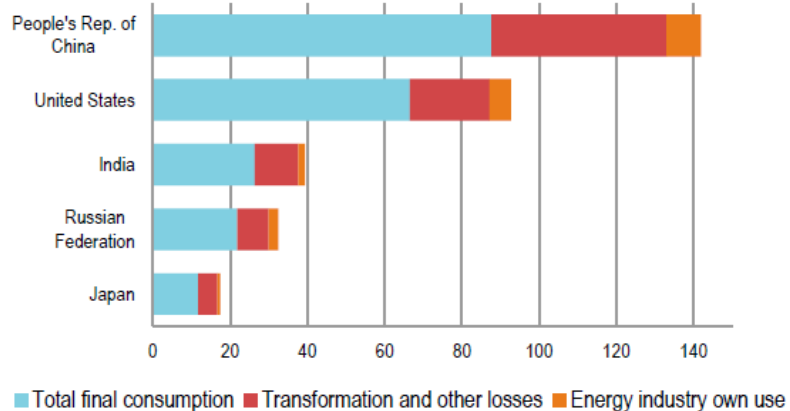


Share of electricity final consumption by sector, 1973 and 2019

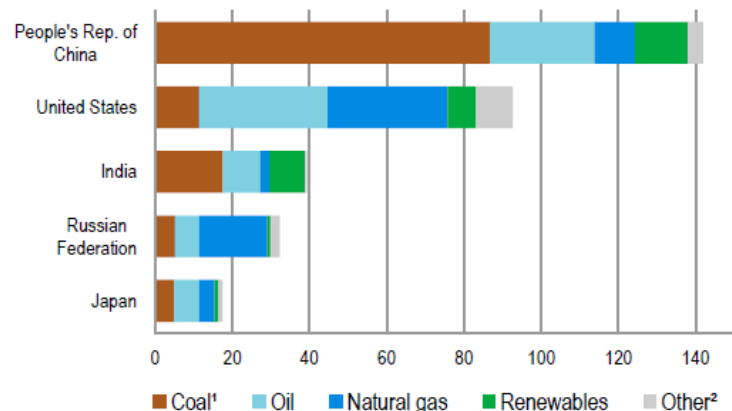


## Top five countries by total energy supply (TES)

Top five countries by total energy supply by sector, 2019 (EJ)

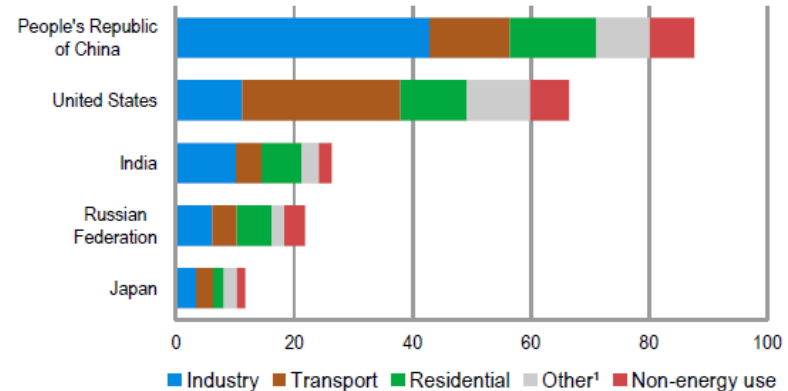


Top five countries by total energy supply by energy source, 2019 (EJ)

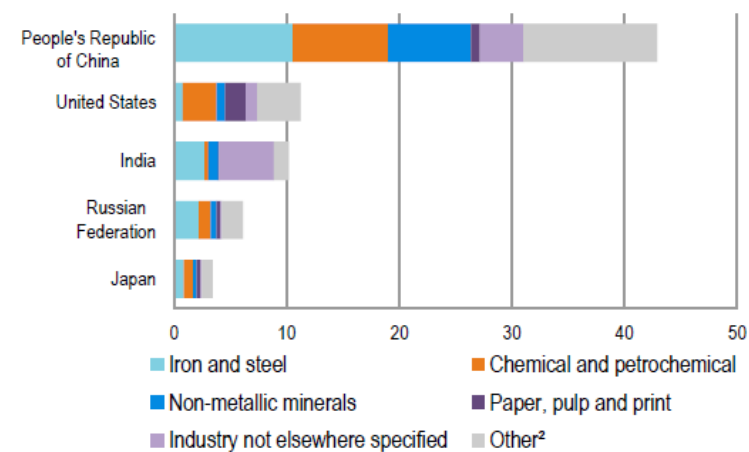


## Top five countries by total final consumption (TFC)

Top five countries by total final consumption by sector, 2019 (EJ)

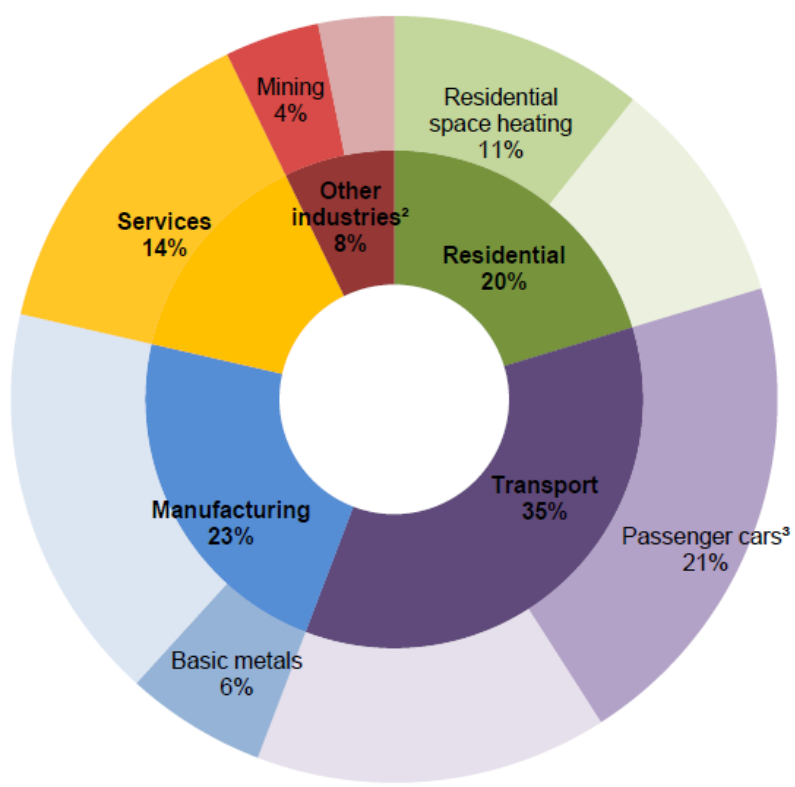


Industry consumption by sub-sector of top five countries by total final consumption, 2019 (EJ)



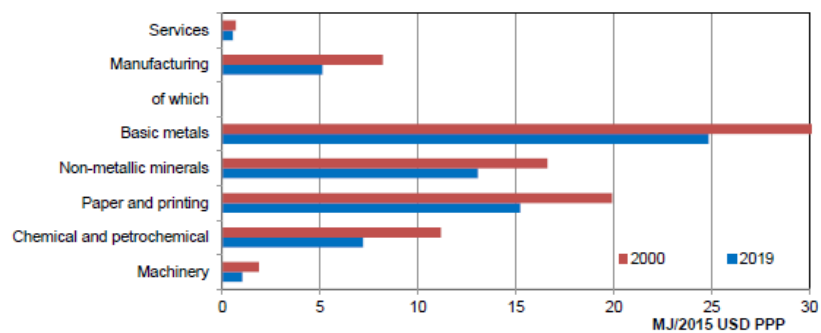
# Energy efficiency indicators

Largest end uses of energy by sector in selected IEA countries<sup>1</sup>, 2019

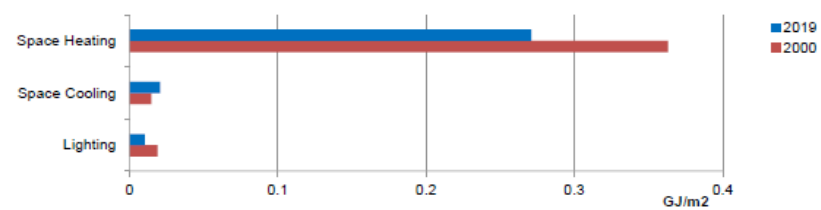


# Energy efficiency indicators

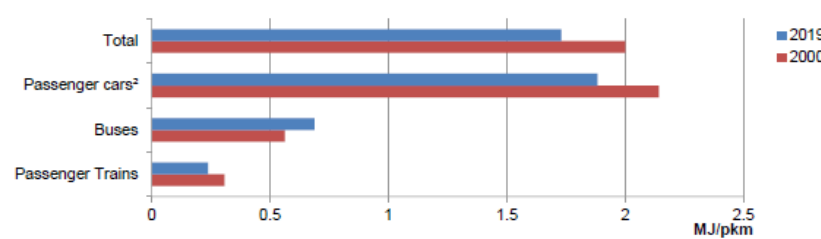
Services and manufacturing in selected IEA countries<sup>1</sup>: energy per value added (MJ/2015 USD PPP)



Residential in selected IEA countries<sup>1</sup>: energy per floor area (GJ/m<sup>2</sup>)



Passenger transport in selected IEA countries<sup>1</sup>: energy per passenger-kilometre (MJ/pkm)



## Simplified energy balance table

World energy balance, 1973

(EJ)

SUPPLY AND CONSUMPTION	Coal <sup>1</sup>	Crude oil	Oil products	Natural gas	Nuclear	Hydro	Biofuels and waste <sup>2</sup>	Other <sup>3</sup>	Total
Production	61.713	123.018	-	41.489	2.221	4.618	25.796	0.257	259.111
Imports	5.864	65.394	17.198	3.074	-	-	0.005	0.341	91.877
Exports	-5.457	-67.533	-18.551	-3.039	-	-	-0.008	-0.348	-94.936
Stock changes	0.523	-0.824	-0.701	-0.632	-	-	0.002	-	-1.632
<b>TES</b>	<b>62.643</b>	<b>120.055</b>	<b>-2.053</b>	<b>40.892</b>	<b>2.221</b>	<b>4.618</b>	<b>25.796</b>	<b>0.250</b>	<b>254.421</b>
Transfers	-	-1.960	2.048	-	-	-	-	-	0.087
Statistical diff.	0.042	0.499	-0.234	0.198	-	-	0.005	-0.030	0.480
Electricity plants	-23.261	-0.942	-13.286	-6.681	-2.217	-4.618	-0.097	21.087	-30.012
CHP plants	-3.618	-	-1.198	-2.129	-0.004	-	-0.039	4.227	-2.761
Heat plants	-0.327	-	-0.038	-0.029	-	-	-0.033	0.298	-0.129
Blast furnaces	-3.416	-	-0.114	-	-	-	-0.002	-	-3.532
Gas works	0.412	-0.025	-0.380	-0.259	-	-	-	-	-0.251
Coke ovens <sup>4</sup>	-4.160	-	-0.034	-0.008	-	-	-0.001	-	-4.203
Oil refineries	-	-116.518	115.610	-	-	-	-	-	-0.908
Petchem. plants	-	0.213	-0.225	-	-	-	-	-	-0.012
Liquefaction plants	-0.030	0.010	-	-	-	-	-	-	-0.021
Other transf.	-	-	-0.005	-0.001	-	-	-1.159	-	-1.165
Energy ind. own use	-1.463	-0.108	-6.705	-4.457	-	-	-0.008	-2.414	-15.154
Losses	-0.379	-0.296	-0.011	-0.239	-	-	-0.011	-1.807	-2.742
<b>TFC</b>	<b>26.444</b>	<b>0.927</b>	<b>93.376</b>	<b>27.288</b>	-	-	<b>24.452</b>	<b>21.612</b>	<b>194.099</b>
Industry	14.898	0.687	18.140	14.922	-	-	3.578	12.009	64.234
Transport <sup>5</sup>	1.335	-	42.735	0.742	-	-	0.010	0.444	45.266
Other	9.958	0.000	21.772	10.855	-	-	20.863	9.159	72.608
Non-energy use	0.254	0.240	10.728	0.769	-	-	-	-	11.991

B  
A  
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E

## Simplified energy balance table

World energy balance, 2019

(EJ)

SUPPLY AND CONSUMPTION	Coal <sup>1</sup>	Crude oil	Oil products	Natural gas	Nuclear	Hydro	Biofuels and waste <sup>2</sup>	Other <sup>3</sup>	Total
Production	167.549	190.442	-	143.639	30.461	15.195	56.539	13.513	617.338
Imports	35.644	102.662	56.858	42.995	-	-	1.341	2.589	242.089
Exports	-37.098	-102.077	-60.177	-44.313	-	-	-1.076	-2.606	-247.347
Stock changes	-3.720	-0.177	-0.167	-1.537	-	-	0.009	-	-5.591
<b>TES</b>	<b>162.376</b>	<b>190.851</b>	<b>-3.486</b>	<b>140.784</b>	<b>30.461</b>	<b>15.195</b>	<b>56.813</b>	<b>13.496</b>	<b>606.490</b>
Transfers	-0.104	-9.823	11.218	-	-	-	-0.000	-	1.291
Statistical diff.	-1.850	0.839	-0.107	-0.881	-	-	0.033	0.998	-0.968
Electricity plants	-72.727	-1.417	-5.727	-38.996	-30.315	-15.195	-5.156	71.087	-98.445
CHP plants	-29.624	-0.000	-0.575	-13.993	-0.146	-	-3.364	26.012	-21.690
Heat plants	-1.042	-0.022	-0.359	-2.552	-	-	-0.540	4.087	-0.428
Blast furnaces	-7.902	-	-0.006	-0.001	-	-	-0.002	-	-7.912
Gas works	-0.706	-	-0.120	0.254	-	-	-0.040	-	-0.612
Coke ovens <sup>4</sup>	-4.138	-	-0.086	-0.001	-	-	-0.005	-	-4.230
Oil refineries	-	-182.111	178.099	-	-	-	-	-	-4.012
Petchem. plants	-	1.501	-1.493	-	-	-	-	-	0.009
Liquefaction plants	-0.953	0.892	-	-0.730	-	-	-	-	-0.791
Other transf.	-0.012	0.562	-0.025	-0.999	-	-	-3.637	-0.024	-4.135
Energy ind. own use	-3.433	-0.357	-8.949	-13.438	-	-	-0.680	-10.182	-37.039
Losses	-0.099	-0.317	-0.008	-1.041	-	-	-0.008	-8.082	-9.554
<b>TFC</b>	<b>39.786</b>	<b>0.599</b>	<b>168.375</b>	<b>68.405</b>	-	-	<b>43.415</b>	<b>97.392</b>	<b>417.973</b>
Industry	32.571	0.065	12.208	25.700	-	-	9.895	40.540	120.979
Transport <sup>5</sup>	0.040	0.000	110.471	4.963	-	-	3.987	1.510	120.972
Other	5.101	0.001	17.752	29.591	-	-	29.533	55.342	137.319
Non-energy use	2.074	0.533	27.945	8.152	-	-	-	-	38.703



## Energy prices<sup>1</sup> in selected OECD countries in USD/unit

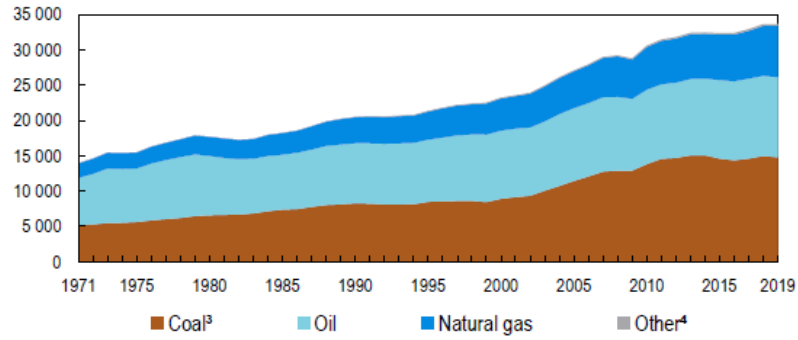
Country	Heavy fuel oil for industry <sup>2</sup> (tonne)	Light fuel oil for households (1 000 litres)	Automotive diesel oil <sup>3</sup> (litre)	Unleaded premium <sup>4</sup> (litre)
Australia	..	..	..	1.150
Austria	518.35	796.86	1.170	1.400
Belgium	483.09	658.43	1.370	1.630
Canada	..	745.58	0.740	1.080
Chile	..	809.04	..	1.070
Colombia	..	..	..	..
Czech Republic	c	815.95	1.080	1.350
Denmark	828.52	1 620.88	1.250	1.840
Estonia	..	981.75	1.140	1.540
Finland	..	1 100.88	1.400	1.860
France	664.39	993.63	1.350	1.760
Germany	..	744.50	1.310	1.740
Greece	562.86	1 098.13	1.230	1.830
Hungary	642.71	x	1.100	1.350
Iceland	..	..	..	..
Ireland	677.76	735.20	1.260	1.640
Israel	c	1 179.17	c	1.800
Italy	..	..	..	..
Japan	591.07	804.99	0.950	1.340
Korea	562.53	789.85	..	1.540
Latvia	..	805.90	1.100	1.450
Lithuania	409.53	607.84	1.060	1.360
Luxembourg	..	695.48	1.140	1.460
Mexico	..	x	..	..
Netherlands	651.19	1 326.78	1.340	2.020
New Zealand	362.58	..	0.650	1.590
Norway	..	..	1.370	1.820
Poland	475.56	851.44	1.050	1.290
Portugal	799.05	1 345.14	1.440	1.800
Slovak Republic	461.87	..	1.150	1.560
Slovenia	..	1 080.24	1.130	1.310
Spain	528.31	746.17	1.110	1.480
Sweden	989.31	..	..	..
Switzerland	..	843.11	1.340	1.700
Turkey	546.84	794.79	0.900	0.990
United Kingdom	c	727.95	1.440	1.660
United States	455.80	755.93	0.770	0.780

## Energy prices<sup>1</sup> in selected OECD countries in USD/unit

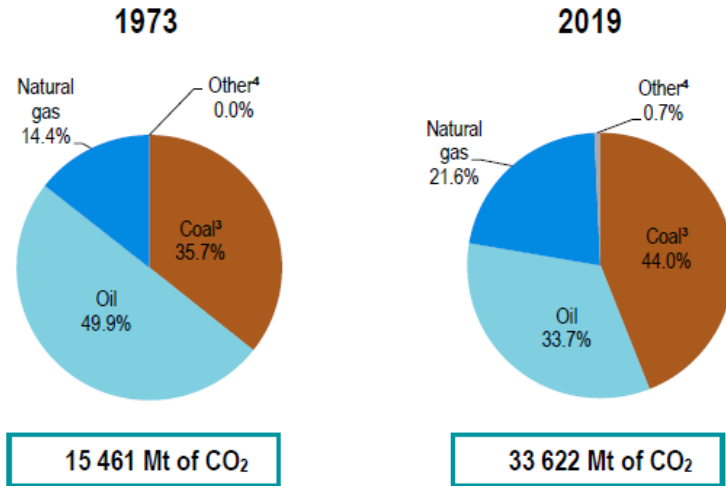
Nat. gas for industry (MWh GCV <sup>5</sup> )	Nat. gas for households (MWh GCV <sup>5</sup> )	Steam coal for industry <sup>6</sup> (tonne)	Electricity for industry (MWh)	Electricity for households (MWh)	Country
..	..	..	..	209.78	Australia
29.29	76.81	199.02	118.56	236.69	Austria
22.64	57.41	93.15	137.63	313.53	Belgium
9.87	24.86	..	89.70	109.02	Canada
c	101.98	..	164.56	180.38	Chile
13.86	41.87	..	95.18	148.48	Colombia
29.12	68.06	c	111.12	203.12	Czech Republic
29.09	85.40	..	77.12	306.67	Denmark
27.33	48.87	..	93.34	143.15	Estonia
..	..	302.60	77.97	207.46	Finland
37.78	87.87	..	124.63	214.98	France
26.40	77.67	..	173.38	344.66	Germany
..	..	x	..	..	Greece
22.97	35.74	x	78.27	115.45	Hungary
..	..	..	..	..	Iceland
43.38	85.93	..	126.62	261.31	Ireland
c	x	x	..	..	Israel
..	..	..	..	..	Italy
..	..	93.13	161.86	255.21	Japan
39.84	55.12	..	94.33	103.95	Korea
27.26	43.18	..	124.29	187.01	Latvia
23.68	42.22	..	105.00	154.95	Lithuania
23.71	43.79	x	84.84	217.94	Luxembourg
..	..	x	..	..	Mexico
25.92	108.53	..	111.68	162.25	Netherlands
16.67	91.99	c	99.29	190.10	New Zealand
x	x	..	20.15	82.58	Norway
20.61	48.99	84.92	107.48	169.46	Poland
29.93	89.35	c	127.72	242.29	Portugal
30.26	60.67	..	147.55	197.72	Slovak Republic
31.52	64.58	c	100.16	173.19	Slovenia
25.87	98.91	..	117.11	274.80	Spain
38.08	116.80	c	62.96	174.04	Sweden
64.94	102.50	86.30	126.14	224.36	Switzerland
23.56	26.06	67.07	102.61	102.68	Turkey
25.46	53.13	115.77	157.19	235.35	United Kingdom
10.86	35.77	64.85	66.61	131.96	United States

## CO<sub>2</sub> emissions by fuel

World<sup>1</sup> CO<sub>2</sub> emissions from fuel combustion<sup>2</sup> by fuel, 1971-2019 (Mt of CO<sub>2</sub>)



Fuel share of CO<sub>2</sub> emissions from fuel combustion<sup>2</sup>, 1973 and 2019

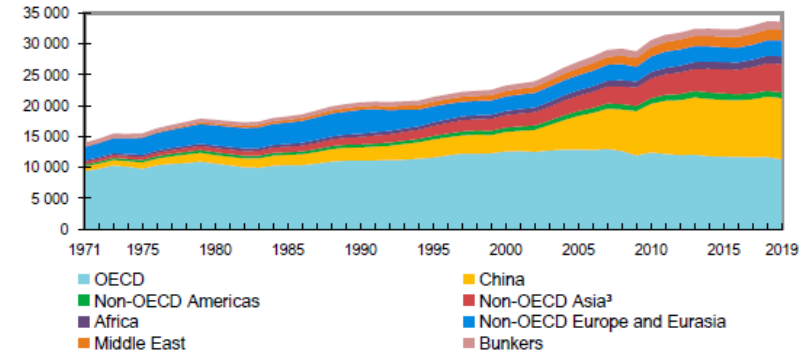


15 461 Mt of CO<sub>2</sub>

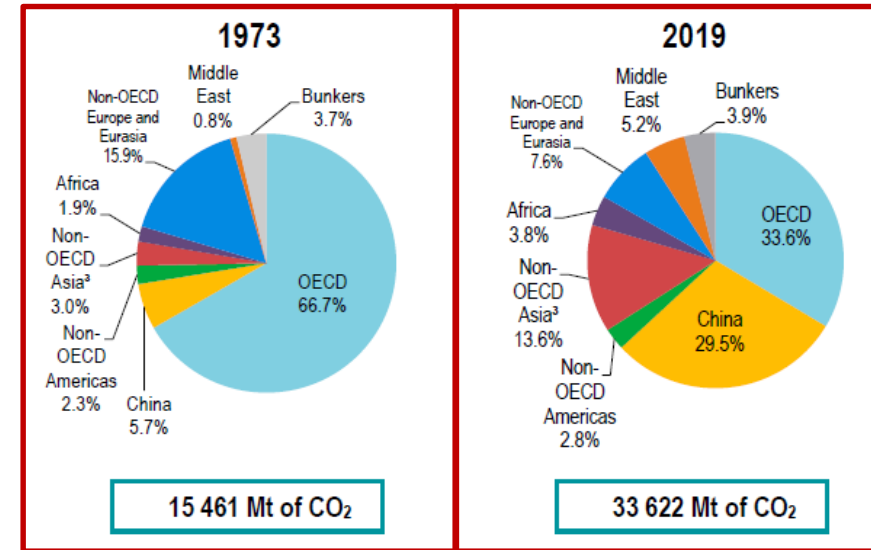
33 622 Mt of CO<sub>2</sub>

## CO<sub>2</sub> emissions by region

World<sup>1</sup> CO<sub>2</sub> emissions from fuel combustion<sup>2</sup> by region, 1971-2019 (Mt of CO<sub>2</sub>)



Share of world CO<sub>2</sub> emissions from fuel combustion<sup>2</sup> by region, 1973 and 2019



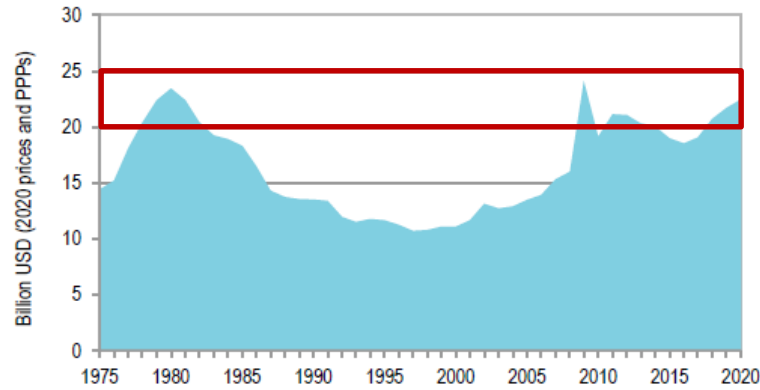
15 461 Mt of CO<sub>2</sub>

33 622 Mt of CO<sub>2</sub>

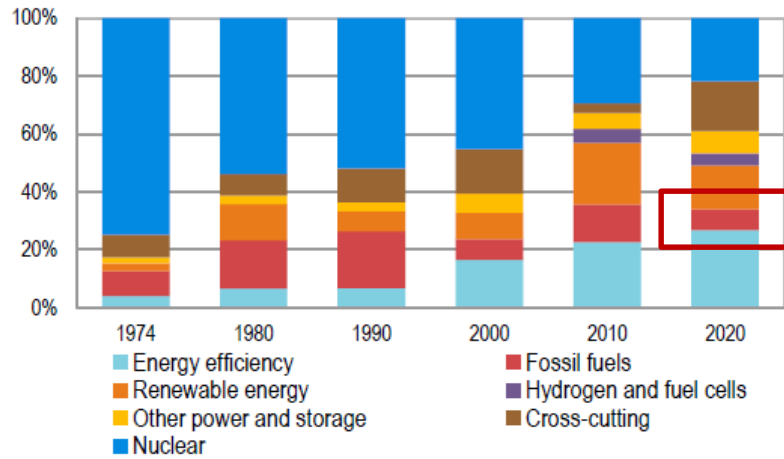


# Research, development and demonstration (RD&D)

IEA total<sup>1</sup> public energy technology RD&D budget, 1975-2020

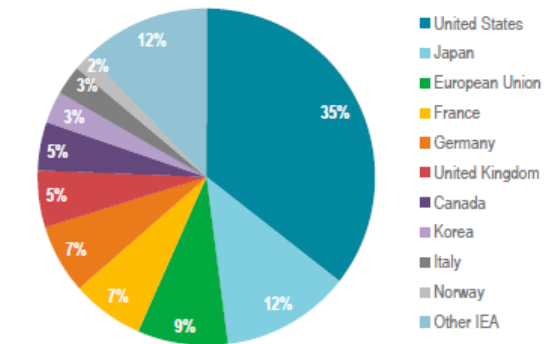


IEA total public energy RD&D budget by technology, 1974-2020

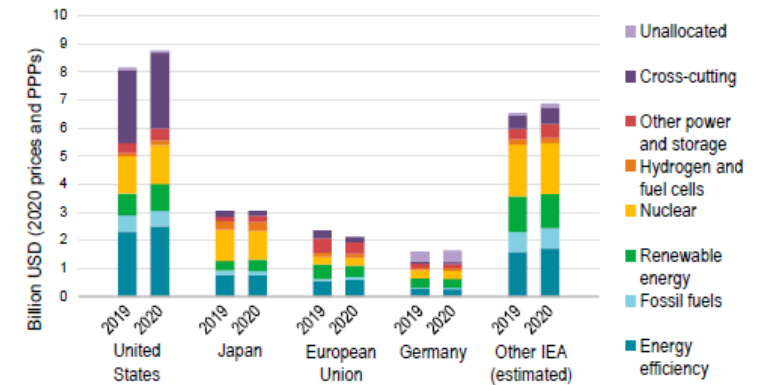


# Research, development and demonstration (RD&D)

Public energy RD&D budgets by country for IEA members and the European Union<sup>1</sup>, latest available year

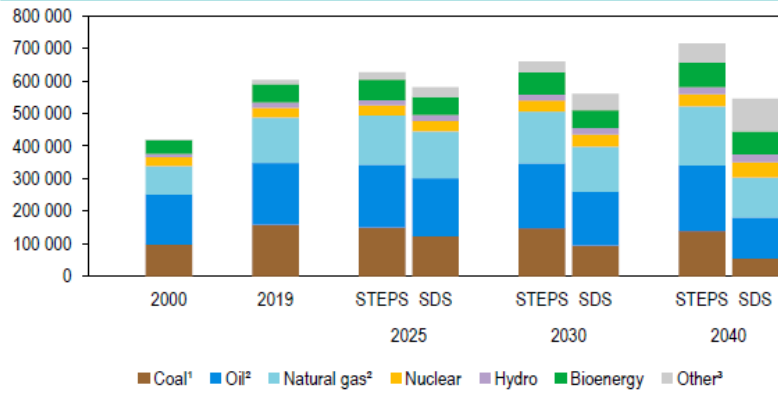


2019 and 2020 budgets by technology in selected IEA countries and the European Union



# Outlook for world total energy supply (TES) to 2040

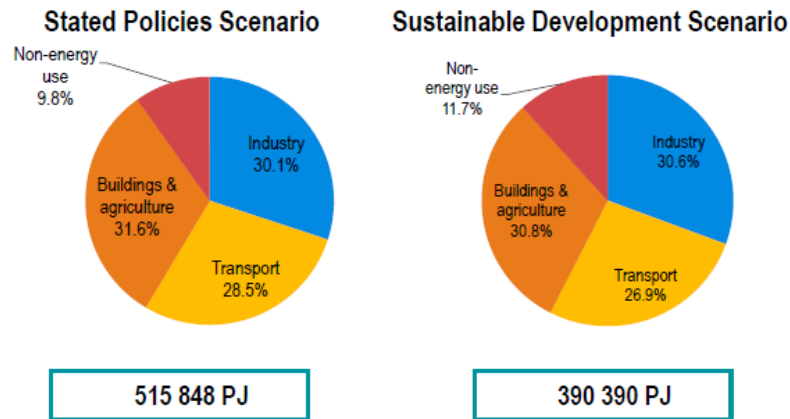
Total energy supply outlook by fuel and scenario, 2000-2040 (PJ)



**STEPS: Stated Policies Scenario**  
Incorporates existing energy policies as well as an assessment of the results likely to stem from the implementation of announced policy intentions.

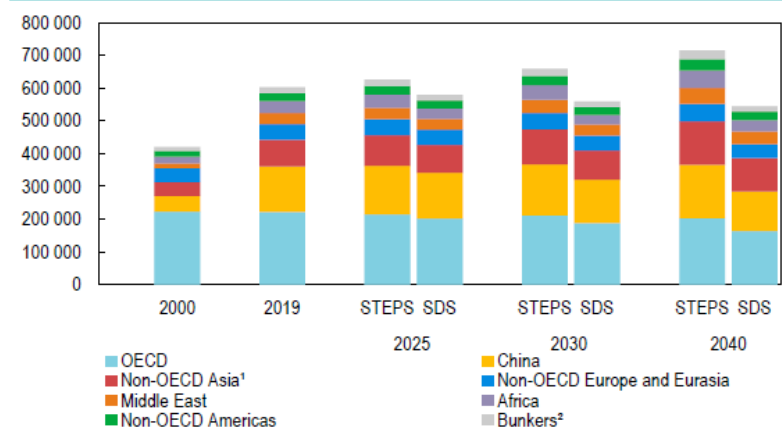
**SDS: Sustainable Development Scenario<sup>4</sup>**  
Outlines an integrated approach to achieving internationally agreed objectives on climate change, air quality and universal access to modern energy.

Total final consumption by sector and scenario, 2040



# Outlook for world total energy supply (TES) to 2040

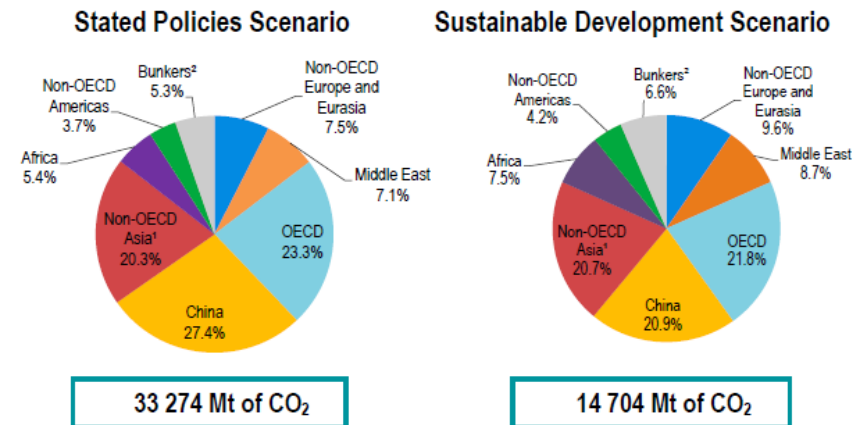
Total energy supply outlook by region and scenario, 2000-2040 (PJ)



**STEPS: Stated Policies Scenario**  
Incorporates existing energy policies as well as an assessment of the results likely to stem from the implementation of announced policy intentions.

**SDS: Sustainable Development Scenario<sup>4</sup>**  
Outlines an integrated approach to achieving internationally agreed objectives on climate change, air quality and universal access to modern energy.

Share of CO<sub>2</sub> emissions<sup>3</sup> by region and scenario, 2040



## Selected indicators for 2019

Region / Country / Economy	Population (million)	GDP (billion 2015 USD)	GDP (PPP) (billion 2015 USD)	Energy prod. (PJ)	Net imports (PJ)	TES (PJ)	Elec. cons. <sup>1</sup> (TWh)	CO <sub>2</sub> emissions <sup>2</sup> (Mt of CO <sub>2</sub> )
World	7 666	84 165	127 207	617 338	-	606 490 <sup>(3)</sup>	25 027	33 622 <sup>(4)</sup>
OECD	1 357	51 300	58 478	194 678	40 747	224 789	10 549	11 318
Middle East	243	2 219	4 806	82 850	-50 288	31 146	1 060	1 754
Non-OECD Europe and Eurasia	341	2 545	6 647	84 853	-34 178	48 871	1 604	2 548
China	1 405	14 651	23 479	113 854	32 839	142 493	7 202	9 919
Non-OECD Asia	2 563	7 174	20 958	65 436	20 537	82 273	2 927	4 575
Non-OECD Americas	449	3 717	6 483	25 972	-1 674	23 447	953	942
Africa	1 308	2 614	6 421	49 696	-13 242	35 882	732	1 263
Albania	2.9	13.0	38.3	72	32	97	6.6	4.0
Algeria	43.1	177.4	510.1	6 213	-3 555	2 637	71.5	142.4
Angola	31.8	109.8	193.3	3 370	-2 760	624	13.7	18.8
Argentina	44.9	570.5	831.8	3 273	88	3 326	129.4	162.2
Armeria	3.0	12.9	35.6	39	107	142	6.2	5.9
Australia	25.4	1 338.6	1 209.0	18 623	-12 727	5 390	251.1	380.7
Austria	8.9	415.0	468.3	502	1 043	1 398	74.1	63.0
Azerbaijan	10.0	53.5	145.2	2 516	-1 828	667	22.5	34.1
Bahrain	1.6	34.7	69.9	1 009	-344	646	33.0	32.6
Bangladesh	163.0	261.5	744.8	1 325	533	1 833	81.8	89.3
Belarus	9.5	58.9	178.7	183	925	1 084	35.4	55.4
Belgium	11.5	492.9	555.4	662	2 086	2 298	88.3	90.2
Benin	11.8	14.2	38.0	121	102	221	1.3	7.1
Bolivia	11.5	38.2	89.7	734	-345	384	8.9	20.9
Bosnia and Herzegovina	3.3	18.2	46.2	226	83	302	12.5	20.7
Botswana	2.3	16.7	38.1	71	40	110	3.7	7.2
Brazil	211.1	1 809.8	3 027.5	13 059	-478	12 255	545.6	411.0
Brunei Darussalam	0.4	13.3	26.6	639	-456	171	4.4	6.6
Bulgaria	7.0	58.0	150.7	488	302	768	35.7	38.0
Cambodia	16.5	23.7	69.2	162	187	338	10.6	12.9
Cameroon	25.9	36.3	69.1	544	-135	409	6.6	6.5
Canada	37.6	1 690.1	1 731.8	22 424	-9 627	12 795	564.6	571.0
Chile	19.0	262.8	439.5	572	1 199	1 732	81.0	90.5

## Selected indicators for 2019

TES/ pop. (GJ/capita)	TES/ GDP (GJ/000 2015 USD)	TES/ GDP(PPP) (GJ/000 2015 USD)	Elec. cons./pop. (kWh/capita)	CO <sub>2</sub> / TES (tCO <sub>2</sub> /TJ)	CO <sub>2</sub> / pop. (tCO <sub>2</sub> /capita)	CO <sub>2</sub> / GDP (kgCO <sub>2</sub> / 2015 USD)	CO <sub>2</sub> /GDP (PPP) (kgCO <sub>2</sub> / 2015 USD)	Region / Country / Economy
79.1	7.21	4.77	3 265	55.44	4.39	0.4	0.26	World
165.6	4.38	3.84	7 773	50.35	8.34	0.22	0.19	OECD
128.1	14.04	6.48	4 359	56.32	7.22	0.79	0.37	Middle East
143.4	19.2	7.35	4 706	52.13	7.48	1	0.38	Non-OECD Europe and Eurasia
101.4	9.73	6.07	5 125	69.61	7.06	0.68	0.42	China
32.1	11.47	3.93	1 142	55.61	1.79	0.64	0.22	Non-OECD Asia
52.2	6.31	3.62	2 121	40.17	2.1	0.25	0.15	Non-OECD Americas
27.4	13.72	5.59	560	35.19	0.97	0.48	0.2	Africa
34.2	7.50	2.54	2 298	41.54	1.42	0.31	0.11	Albania
61.3	14.87	5.17	1 660	53.98	3.31	0.80	0.28	Algeria
19.6	5.69	3.23	431	30.05	0.59	0.17	0.10	Angola
74.0	5.83	4.00	2 879	48.77	3.6	0.28	0.20	Argentina
48.1	11.06	4.00	2 087	41.12	1.95	0.45	0.16	Armeria
212.5	4.03	4.46	9 897	70.64	15.01	0.28	0.31	Australia
157.5	3.37	2.99	8 342	45.06	7.1	0.15	0.13	Austria
66.6	12.48	4.60	2 244	51.03	3.45	0.64	0.23	Azerbaijan
393.5	18.60	9.24	20 132	50.48	19.86	0.94	0.47	Bahrain
11.2	7.01	2.46	502	48.70	0.55	0.34	0.12	Bangladesh
114.5	18.41	6.07	3 741	51.10	5.85	0.94	0.31	Belarus
200.0	4.66	4.14	7 686	39.25	7.85	0.18	0.16	Belgium
18.7	15.58	5.81	106	32.09	0.60	0.50	0.19	Benin
33.3	10.04	4.27	777	54.35	1.81	0.55	0.23	Bolivia
91.5	16.62	6.54	3 786	68.50	6.27	1.14	0.45	Bosnia and Herzegovina
47.9	6.63	2.90	1 610	65.67	3.15	0.44	0.19	Botswana
58.1	6.77	4.05	2 585	33.54	1.95	0.23	0.14	Brazil
394.6	12.87	6.41	10 244	38.56	15.22	0.50	0.25	Brunei Darussalam
110.0	13.24	5.09	5 121	49.53	5.4	0.66	0.25	Bulgaria
20.5	14.25	4.89	640	38.02	0.73	0.54	0.19	Cambodia
15.0	11.20	4.50	250	15.92	0.25	0.10	0.07	Cameroon
340.3	7.57	7.39	15 018	44.63	15.19	0.34	0.33	Canada
81.0	0.50	0.04	4 254	52.20	4.75	0.04	0.21	Chile

ENERGY

INDICATORS

Et les américains? Un peu moins que les canadiens en TCO<sub>2</sub>eq/cap.

## Selected indicators for 2019

Region / Country / Economy	Population (million)	GDP (billion 2015 USD)	GDP (PPP) (billion 2015 USD)	Energy prod. (PJ)	Net imports (PJ)	TES (PJ)	Elec. cons. <sup>1</sup> (TWh)	CO <sub>2</sub> emissions <sup>2</sup> (Mt of CO <sub>2</sub> )
China (People's Rep. of)	1 397.7	14 317.8	23 035.6	113 848	31 550	141 903	7 154.3	9 876.5
Colombia	48.9	321.7	684.1	5 329	-3 360	1 844	75.0	74.9
Republic of the Congo	5.4	8.2	15.6	845	-700	136	2.0	3.7
Costa Rica	5.0	62.2	91.2	112	121	222	10.5	7.5
Côte d'Ivoire	25.7	60.2	141.9	436	20	445	7.6	10.7
Croatia	4.1	55.9	109.1	163	208	359	17.2	15.3
Cuba	11.3	94.2	292.6	200	218	401	17.3	25.2
Curaçao <sup>3</sup>	0.2	1.8	1.7	1	99	32	0.8	2.2
Cyprus <sup>3</sup>	0.9	23.7	32.2	7	113	95	5.0	6.4
Czech Republic	10.7	214.1	407.1	1 124	735	1 790	69.6	94.3
DPR Korea	25.7	29.8	111.7	606	47	653	11.4	53.4
Dem. Rep. of the Congo	86.8	44.5	81.0	1 285	-12	1 267	9.1	2.2
Denmark	5.8	337.7	311.0	512	292	670	33.7	28.4
Dominican Republic	10.7	89.3	190.2	45	384	412	17.3	25.2
Ecuador	17.4	101.7	183.7	1 299	-639	644	26.2	35.4
Egypt	100.4	402.1	1 286.1	3 922	144	4 027	180.4	225.5
El Salvador	6.5	25.8	52.8	82	117	191	6.6	7.4
Equatorial Guinea	1.4	10.0	21.4	588	-501	85	1.5	4.8
Eritrea	4.9	5.1	13.3	27	11	37	0.4	0.8
Estonia	1.3	27.5	46.1	226	10	219	9.3	9.9
Ethiopia	112.1	89.6	231.8	1 679	228	1 875	10.7	14.8
Finland	5.5	255.3	253.5	805	607	1 395	86.0	40.1
France	67.5	2 616.8	2 916.5	5 493	5 043	10 152	475.1	293.9
Gabon	2.2	15.4	30.6	638	-436	195	2.4	2.4
Georgia	3.7	17.8	53.6	46	172	214	12.3	9.3
Germany	83.1	3 586.2	4 153.9	4 371	8 687	12 323	548.9	644.1
Ghana	30.4	61.5	180.4	702	-221	468	13.5	18.2
Gibraltar	0.0	1.5	1.3	0	185	11	0.2	0.7
Greece	10.7	203.7	301.5	252	809	924	54.9	56.6
Guatemala	16.6	70.5	144.6	401	261	609	11.2	17.8
Guyana	0.8	3.7	7.4	6	37	41	0.9	2.7
Haiti	11.3	9.0	18.8	147	44	190	0.4	3.2

## Selected indicators for 2019

TES/ pop. (GJ/capita)	TES/ GDP (GJ/000 2015 USD)	TES/ GDP(PPP) (GJ/000 2015 USD)	Elec. cons./pop. (kWh/capita)	CO <sub>2</sub> / TES (tCO <sub>2</sub> /TJ)	CO <sub>2</sub> / pop. (tCO <sub>2</sub> /capita)	CO <sub>2</sub> / GDP (kgCO <sub>2</sub> / 2015 USD)	CO <sub>2</sub> /GDP (PPP) (kgCO <sub>2</sub> / 2015 USD)	Region / Country / Economy
101.5	9.91	6.16	5 119	69.60	7.07	0.69	0.43	China (People's Rep. of)
37.7	5.73	2.70	1 533	40.60	1.53	0.23	0.11	Colombia
25.2	16.48	8.70	374	26.97	0.68	0.44	0.23	Republic of the Congo
43.9	3.57	2.43	2 089	33.81	1.49	0.12	0.08	Costa Rica
17.3	7.39	3.13	294	24.15	0.42	0.18	0.08	Côte d'Ivoire
88.3	6.43	3.29	4 237	42.69	3.77	0.27	0.14	Croatia
35.4	4.25	1.37	1 524	62.82	2.22	0.27	0.09	Cuba
203.5	17.39	19.38	4 954	67.52	13.74	1.17	1.31	Curaçao <sup>1</sup>
108.2	4.01	2.95	5 659	67.55	7.31	0.27	0.20	Cyprus <sup>1</sup>
167.8	8.36	4.40	6 527	52.68	8.84	0.44	0.23	Czech Republic
25.4	21.94	5.84	445	81.84	2.08	1.80	0.48	DPR Korea
14.6	28.47	15.64	105	1.75	0.03	0.05	0.03	Dem. Rep. of the Congo
115.1	1.98	2.15	5 798	42.33	4.87	0.08	0.09	Denmark
38.3	4.61	2.16	1 609	61.21	2.35	0.28	0.13	Dominican Republic
37.1	6.33	3.51	1 506	54.89	2.03	0.35	0.19	Ecuador
40.1	10.02	3.13	1 597	55.99	2.25	0.56	0.18	Egypt
29.6	7.42	3.62	1 020	38.72	1.15	0.29	0.14	El Salvador
62.7	8.48	3.98	1 138	56.39	3.54	0.48	0.22	Equatorial Guinea
7.7	7.29	2.81	87	20.48	0.16	0.15	0.06	Eritrea
165.6	7.98	4.76	6 998	45.02	7.46	0.36	0.21	Estonia
16.7	20.94	8.09	96	7.87	0.13	0.16	0.06	Ethiopia
252.7	5.47	5.50	15 568	28.76	7.27	0.16	0.16	Finland
150.5	3.88	3.48	7 043	28.95	4.36	0.11	0.10	France
89.5	12.65	6.35	1 107	12.57	1.13	0.16	0.08	Gabon
57.4	12.01	3.99	3 312	43.62	2.50	0.52	0.17	Georgia
148.3	3.44	2.97	6 606	52.27	7.75	0.18	0.16	Germany
15.4	7.62	2.60	444	38.76	0.60	0.30	0.10	Ghana
326.4	7.31	8.48	6 266	64.57	21.08	0.47	0.55	Gibraltar
86.2	4.54	3.07	5 118	61.29	5.28	0.28	0.19	Greece
36.7	8.64	4.21	672	29.29	1.07	0.25	0.12	Guatemala
52.2	11.11	5.53	1 139	65.71	3.43	0.73	0.36	Guyana
16.9	21.08	10.09	37	17.07	0.29	0.36	0.17	Haiti

## Selected indicators for 2019

Region / Country / Economy	Population (million)	GDP (billion 2015 USD)	GDP (PPP) (billion 2015 USD)	Energy prod. (PJ)	Net imports (PJ)	TES (PJ)	Elec. cons. <sup>1</sup> (TWh)	CO <sub>2</sub> emissions <sup>2</sup> (Mt of CO <sub>2</sub> )
Honduras	9.7	24.3	51.0	114	132	240	7.6	9.5
Hong Kong, China	7.5	333.5	443.3	6	1 289	590	47.6	42.6
Hungary	9.8	147.0	309.7	461	779	1 116	43.4	45.4
Iceland	0.4	20.8	19.4	223	43	252	19.0	1.6
India	1 366.4	2 716.8	9 247.0	24 290	15 303	39 270	1 349.3	2 310.0
Indonesia	270.6	1 049.3	3 227.4	19 695	-9 648	10 092	271.7	583.4
Islamic Rep. of Iran	82.9	409.0	1 133.2	14 718	-3 199	11 424	284.8	583.5
Iraq	39.3	207.0	431.1	10 428	-8 092	2 313	51.5	138.2
Ireland	4.9	371.9	413.9	171	429	571	29.3	33.9
Israel <sup>3</sup>	9.1	345.5	342.3	336	652	908	63.6	60.9
Italy	60.3	1 914.7	2 336.2	1 441	5 128	6 237	314.2	309.3
Jamaica	2.9	14.9	26.7	9	141	128	3.3	8.1
Japan	126.1	4 592.1	5 372.1	2 086	15 788	17 388	1 000.9	1 056.2
Jordan	10.1	41.2	93.7	26	379	386	18.4	22.8
Kazakhstan	18.5	211.1	466.5	6 989	-3 907	3 060	96.7	205.0
Kenya	52.6	79.6	200.1	945	297	1 209	8.3	20.1
Korea	51.7	1 634.9	2 156.3	2 025	10 333	11 731	562.5	585.7
Kosovo <sup>3</sup>	1.8	7.6	20.1	77	34	112	5.2	8.6
Kuwait	4.2	114.2	180.6	6 786	-5 225	1 553	68.4	89.4
Kyrgyzstan	6.5	7.9	29.8	100	65	168	12.6	9.3
Lao People's Dem. Rep.	7.2	18.3	52.9	289	-49	237	6.2	17.2
Latvia	1.9	30.6	55.4	118	91	188	7.1	7.0
Lebanon	6.9	47.3	93.3	11	362	362	19.4	25.5
Libya	6.8	40.5	114.0	3 225	-2 295	916	27.4	45.9
Lithuania	2.8	48.0	97.1	83	252	319	12.4	11.2
Luxembourg	0.6	64.9	66.3	10	181	165	7.6	9.1
Malaysia	32.0	363.7	906.1	4 099	-120	3 847	163.0	236.6
Malta	0.5	13.5	20.3	1	129	30	2.6	1.7
Mauritius	1.3	13.5	28.1	9	93	62	3.1	4.2
Mexico	125.8	1 254.4	2 387.2	6 250	1 472	7 692	305.0	419.4
Moldova	2.7	9.1	30.9	29	141	167	5.8	8.3

## Selected indicators for 2019

TES/ pop. (GJ/capita)	TES/ GDP (GJ/000 2015 USD)	TES/ GDP(PPP) (GJ/000 2015 USD)	Elec. cons./pop. (kWh/capita)	CO <sub>2</sub> / TES (tCO <sub>2</sub> /TJ)	CO <sub>2</sub> / pop. (tCO <sub>2</sub> /capita)	CO <sub>2</sub> / GDP (kgCO <sub>2</sub> / 2015 USD)	CO <sub>2</sub> /GDP (PPP) (kgCO <sub>2</sub> / 2015 USD)	Region / Country / Economy
24.6	9.87	4.71	782	39.37	0.97	0.39	0.19	Honduras
78.6	1.77	1.33	6 338	72.27	5.68	0.13	0.10	Hong Kong, China
114.2	7.59	3.60	4 446	40.64	4.64	0.31	0.15	Hungary
697.4	12.08	13.00	52 514	6.50	4.53	0.08	0.08	Iceland
28.7	14.45	4.25	987	58.82	1.69	0.85	0.25	India
37.3	9.62	3.13	1 004	57.81	2.16	0.56	0.18	Indonesia
137.8	27.93	10.08	3 435	51.08	7.04	1.43	0.51	Islamic Rep. of Iran
58.8	11.17	5.37	1 310	59.74	3.52	0.67	0.32	Iraq
115.9	1.54	1.38	5 949	59.30	6.87	0.09	0.08	Ireland
100.3	2.63	2.65	7 024	67.05	6.73	0.18	0.18	Israel <sup>1</sup>
103.4	3.26	2.67	5 207	49.60	5.13	0.16	0.13	Italy
43.5	8.60	4.80	1 114	62.83	2.73	0.54	0.30	Jamaica
137.8	3.79	3.24	7 935	60.74	8.37	0.23	0.20	Japan
38.3	9.38	4.13	1 820	59.09	2.26	0.55	0.24	Jordan
165.3	14.49	6.56	5 223	67.01	11.08	0.97	0.44	Kazakhstan
23.0	15.20	6.04	157	16.62	0.38	0.25	0.10	Kenya
226.9	7.18	5.44	10 878	49.93	11.33	0.36	0.27	Korea
62.2	14.77	5.56	2 915	77.13	4.80	1.14	0.43	Kosovo <sup>1</sup>
369.1	13.60	8.60	16 254	57.59	21.26	0.78	0.50	Kuwait
26.1	21.27	5.66	1 951	55.20	1.44	1.17	0.31	Kyrgyzstan
33.0	12.94	4.48	865	72.55	2.40	0.94	0.32	Lao People's Dem. Rep.
98.2	6.15	3.39	3 727	37.30	3.66	0.23	0.13	Latvia
52.7	7.64	3.88	2 835	70.56	3.72	0.54	0.27	Lebanon
135.1	22.63	8.03	4 041	50.11	6.77	1.13	0.40	Libya
114.0	6.63	3.28	4 448	35.00	3.99	0.23	0.11	Lithuania
265.9	2.55	2.49	12 269	54.99	14.62	0.14	0.14	Luxembourg
120.4	10.58	4.25	5 102	61.49	7.41	0.65	0.26	Malaysia
60.5	2.26	1.50	5 078	54.48	3.30	0.12	0.08	Malta
48.7	4.55	2.19	2 412	67.70	3.30	0.31	0.15	Mauritius
61.1	6.13	3.22	2 425	54.53	3.33	0.33	0.18	Mexico
63.0	18.32	5.41	2 172	49.47	3.12	0.91	0.27	Republic of Moldova

## Selected indicators for 2019

Region / Country / Economy	Population (million)	GDP (billion 2015USD)	GDP (PPP) (billion 2015USD)	Energy prod. (PJ)	Net imports (PJ)	TES (PJ)	Elec. cons. <sup>1</sup> (TWh)	CO <sub>2</sub> emissions <sup>2</sup> (Mt of CO <sub>2</sub> )
Mongolia	3.2	14.1	38.8	1 172	-743	279	7.7	22.7
Montenegro	0.6	4.8	11.9	31	15	46	3.2	2.6
Morocco	36.5	112.3	274.4	94	861	932	34.0	65.9
Mozambique	30.4	18.2	39.8	835	-371	464	13.7	6.6
Myanmar	54.0	83.8	287.5	1 208	-220	985	19.8	35.1
Namibia	2.5	11.2	24.2	24	64	86	4.1	3.8
Nepal	28.6	26.6	88.4	445	150	591	6.6	10.0
Netherlands	17.3	840.3	935.0	1 381	2 369	2 995	116.9	146.3
New Zealand	5.0	205.1	198.9	644	271	858	41.9	33.4
Nicaragua	6.5	12.9	33.3	96	74	167	3.9	4.9
Niger	23.3	12.1	28.7	150	-4	142	1.4	2.1
Nigeria	201.0	511.0	1 015.5	10 830	-4 208	6 595	26.7	92.0
North Macedonia (Rep. of)	2.1	11.1	31.8	48	70	117	6.7	8.0
Norway	5.3	406.9	330.4	8 142	-6 997	1 148	127.1	34.9
Oman	5.0	73.7	143.0	3 425	-2 361	982	34.6	69.0
Pakistan	216.6	322.1	1 038.3	3 076	1 621	4 663	116.4	174.5
Panama	4.2	64.0	118.9	35	362	205	10.0	12.6
Paraguay	7.0	40.9	86.8	308	-4	301	13.2	7.8
Peru	32.5	214.8	399.1	1 030	51	1 085	50.7	52.2
Philippines	108.1	395.9	948.2	1 349	1 264	2 580	96.0	135.3
Poland	38.4	570.1	1 217.5	2 484	2 043	4 301	165.7	287.4
Portugal	10.3	221.9	342.0	246	769	911	51.6	42.4
Qatar	2.8	170.0	250.7	9 406	-7 469	1 731	47.1	86.9
Romania	19.4	217.1	523.0	1 027	420	1 379	54.6	70.1
Russian Federation	144.4	1 445.5	3 738.3	64 056	-30 553	32 349	1 004.0	1 640.3
Saudi Arabia	34.3	678.6	1 599.1	26 796	-17 854	8 984	354.5	495.2
Senegal	16.3	22.7	55.4	75	142	201	4.8	8.5
Serbia	6.9	45.5	121.4	428	230	640	33.3	45.1
Singapore	5.7	345.7	540.3	27	3 696	1 441	53.9	47.4
Slovak Republic	5.5	98.9	181.4	295	497	714	28.4	29.7
Slovenia	2.1	50.2	76.0	145	151	285	14.9	13.1

## Selected indicators for 2019

TES/pop. (GJ/capita)	TES/GDP (GJ/000 2015 USD)	TES/GDP(PPP) (GJ/000 2015 USD)	Elec. cons./pop. (kWh/capita)	CO <sub>2</sub> /TES (tCO <sub>2</sub> /TJ)	CO <sub>2</sub> /pop. (tCO <sub>2</sub> /capita)	CO <sub>2</sub> /GDP (kgCO <sub>2</sub> /2015 USD)	CO <sub>2</sub> /GDP (PPP) (kgCO <sub>2</sub> /2015 USD)	Region / Country / Economy
86.4	19.74	7.19	2 390	81.32	7.03	1.61	0.58	Mongolia
73.3	9.58	3.82	5 130	57.05	4.18	0.55	0.22	Montenegro
25.5	8.30	3.40	933	70.73	1.81	0.59	0.24	Morocco
15.3	25.57	11.68	452	14.11	0.22	0.36	0.16	Mozambique
18.2	11.75	3.42	367	35.68	0.65	0.42	0.12	Myanmar
34.6	7.74	3.57	1 635	44.09	1.53	0.34	0.16	Namibia
20.7	22.21	6.68	231	16.95	0.35	0.38	0.11	Nepal
172.7	3.56	3.20	6 737	48.85	8.44	0.17	0.16	Netherlands
171.1	4.18	4.31	8 350	38.95	6.66	0.16	0.17	New Zealand
25.5	12.97	5.02	599	29.22	0.75	0.38	0.15	Nicaragua
6.1	11.72	4.96	58	14.53	0.09	0.17	0.07	Niger
32.8	12.91	6.49	133	13.95	0.46	0.18	0.09	Nigeria
56.3	10.54	3.69	3 225	67.77	3.82	0.71	0.25	North Macedonia (Rep. of)
214.7	2.82	3.47	23 762	30.37	6.52	0.09	0.11	Norway
197.3	13.32	6.86	6 959	70.29	13.87	0.94	0.48	Oman
21.5	14.47	4.49	538	37.43	0.81	0.54	0.17	Pakistan
48.4	3.21	1.73	2 352	61.21	2.96	0.20	0.11	Panama
42.7	7.36	3.47	1 878	25.93	1.11	0.19	0.09	Paraguay
33.4	5.05	2.72	1 558	48.13	1.61	0.24	0.13	Peru
23.9	6.52	2.72	888	52.42	1.25	0.34	0.14	Philippines
112.0	7.54	3.53	4 316	66.82	7.49	0.50	0.24	Poland
88.6	4.11	2.67	5 017	46.53	4.12	0.19	0.12	Portugal
611.3	10.18	6.91	16 632	50.19	30.68	0.51	0.35	Qatar
71.2	6.35	2.64	2 823	50.83	3.62	0.32	0.13	Romania
224.1	22.38	8.65	6 954	50.71	11.36	1.13	0.44	Russian Federation
262.2	13.24	5.62	10 344	55.12	14.45	0.73	0.31	Saudi Arabia
12.3	8.84	3.63	293	42.38	0.52	0.37	0.15	Senegal
92.2	14.09	5.27	4 801	70.49	6.50	0.99	0.37	Serbia
252.7	4.17	2.67	9 449	32.87	8.31	0.14	0.09	Singapore
131.0	7.22	3.94	5 215	41.54	5.44	0.30	0.16	Slovak Republic
136.2	5.67	3.74	7 143	46.12	6.28	0.26	0.17	Slovenia

## Conversion factors and unit abbreviations

### General conversion factors for energy

To:	PJ	Gcal	Mtoe	MBtu	GWh
From:	multiply by:				
PJ	1	2.388 x 10 <sup>6</sup>	2.388 x 10 <sup>2</sup>	9.478 x 10 <sup>6</sup>	2.778 x 10 <sup>2</sup>
Gcal	4.187 x 10 <sup>-6</sup>	1	1.000 x 10 <sup>-7</sup>	3.968	1.163 x 10 <sup>-3</sup>
Mtoe	4.187 x 10 <sup>1</sup>	1.000 x 10 <sup>7</sup>	1	3.968 x 10 <sup>7</sup>	1.163 x 10 <sup>4</sup>
MBtu	1.055 x 10 <sup>-6</sup>	2.520 x 10 <sup>-1</sup>	2.520 x 10 <sup>-8</sup>	1	2.931 x 10 <sup>-4</sup>
GWh	3.600 x 10 <sup>-3</sup>	8.598 x 10 <sup>2</sup>	8.598 x 10 <sup>-5</sup>	3.412 x 10 <sup>3</sup>	1

### Conversion factors for mass

To:	kg	t	lt	st	lb
From:	multiply by:				
kilogramme (kg)	1	1.000 x 10 <sup>-3</sup>	9.842 x 10 <sup>-4</sup>	1.102 x 10 <sup>-3</sup>	2.205
tonne (t)	1.000 x 10 <sup>3</sup>	1	9.842 x 10 <sup>-1</sup>	1.102	2.205 x 10 <sup>3</sup>
long ton (lt)	1.016 x 10 <sup>3</sup>	1.016	1	1.120	2.240 x 10 <sup>3</sup>
short ton (st)	9.072 x 10 <sup>2</sup>	9.072 x 10 <sup>-1</sup>	8.929 x 10 <sup>-1</sup>	1	2.000 x 10 <sup>3</sup>
pound (lb)	4.536 x 10 <sup>-1</sup>	4.536 x 10 <sup>-4</sup>	4.464 x 10 <sup>-4</sup>	5.000 x 10 <sup>-4</sup>	1

### Conversion factors for volume

To:	gal U.S.	gal U.K.	bbl	ft <sup>3</sup>	l	m <sup>3</sup>
From:	multiply by:					
U.S. gallon (gal U.S.)	1	8.327 x 10 <sup>-1</sup>	2.381 x 10 <sup>-2</sup>	1.337 x 10 <sup>-1</sup>	3.785	3.785 x 10 <sup>-3</sup>
U.K. gallon (gal U.K.)	1.201	1	2.859 x 10 <sup>-2</sup>	1.605 x 10 <sup>-1</sup>	4.546	4.546 x 10 <sup>-3</sup>
barrel (bbl)	4.200 x 10 <sup>1</sup>	3.497 x 10 <sup>1</sup>	1	5.615	1.590 x 10 <sup>2</sup>	1.590 x 10 <sup>-1</sup>
cubic foot (ft <sup>3</sup> )	7.481	6.229	1.781 x 10 <sup>-1</sup>	1	2.832 x 10 <sup>1</sup>	2.832 x 10 <sup>-2</sup>
litre (l)	2.642 x 10 <sup>-1</sup>	2.200 x 10 <sup>-1</sup>	6.290 x 10 <sup>-3</sup>	3.531 x 10 <sup>-2</sup>	1	1.000 x 10 <sup>-3</sup>
cubic metre (m <sup>3</sup> )	2.642 x 10 <sup>2</sup>	2.200 x 10 <sup>2</sup>	6.290	3.531 x 10 <sup>1</sup>	1.000 x 10 <sup>3</sup>	1

## Conversion factors and unit abbreviations

### Selected country-specific net calorific values

Steam coal		Crude oil <sup>1</sup>	
Top-ten producers in 2020	kJ/kg	Top-ten producers in 2020	kJ/kg
People's Rep. of China	22 172	United States	42 790
India	17 076	Russian Federation	42 077
Indonesia	20 047	Saudi Arabia	42 538
Australia	26 639	Canada	42 790
United States	23 824	Iraq	42 831
Russian Federation	26 572	People's Rep. of China	41 868
South Africa	22 251	United Arab Emirates	42 622
Kazakhstan	18 177	Brazil	42 705
Poland	24 531	Kuwait	42 538
Colombia	28 760	Islamic Rep. of Iran	42 663

### Default net calorific values

	Oil products			
	OECD Europe <sup>2</sup>	OECD Americas	OECD Asia Oceania	Non-OECD
	kJ/kg			
Refinery gas	49 500	48 100	48 100	48 100
Ethane	49 500	49 400	49 400	49 400
Liquefied petroleum gases	46 000	47 300	47 700	47 300
Motor gasoline excl. biofuels	44 000	44 800	44 600	44 800
Aviation gasoline	44 000	44 800	44 600	44 800
Gasoline type jet fuel	43 000	44 800	44 600	44 800
Kerosene type jet fuel	43 000	44 600	44 500	44 600
Kerosene	43 000	43 800	42 900	43 800
Gas/diesel oil excl. biofuels	42 600	42 600	42 600	43 300
Fuel oil	40 000	40 200	42 600	40 200
Naphtha	44 000	45 000	43 200	45 000
White spirit	43 600	43 000	43 000	43 000
Lubricants	42 000	42 000	42 900	42 000
Bitumen	39 000	40 000	38 800	39 000
Paraffin waxes	40 000	40 000	40 000	40 000
Petroleum coke	32 000	32 000	33 800	32 000
Non-specified oil products	40 000	40 000	40 000	40 000

<sup>1</sup> Excludes NGL, feedstocks, additives and other hydrocarbons.

<sup>2</sup> Defaults for OECD Europe were also applied to non-OECD Europe and Eurasia countries.

# Conversion factors and unit abbreviations

## Selected country-specific gross calorific values

### Natural gas

Top-ten producers in 2020	kJ/m <sup>3</sup>
United States	38 602
Russian Federation	38 230
Islamic Rep. of Iran	39 356
People's Rep. of China	38 931
Canada	39 280
Qatar	41 400
Australia	39 914
Norway	39 349
Saudi Arabia	38 000
Algeria	39 565

Note: To calculate the net calorific value, the gross calorific value is multiplied by 0.9.

### Conventions for electricity

Figures for electricity production, trade, and final consumption are calculated using the energy content of the electricity (i.e. at a rate of 1 TWh = 3.6 PJ). Hydroelectricity production (excluding pumped storage) and electricity produced by other non-thermal means (wind, tide/wave/ocean, solar photovoltaic, etc.) are accounted for similarly using 1 TWh = 3.6 PJ. However, the primary energy equivalent of nuclear electricity is calculated from the gross generation by assuming a 33% conversion efficiency, i.e. 1 TWh (3.6 ÷ 0.33) PJ. For geothermal and solar thermal, if no country-specific information is reported, the primary energy equivalent is calculated as follows:

- 10 % for geothermal electricity
- 50 % for geothermal heat
- 33 % for solar thermal electricity
- 100 % for solar thermal heat.

### Unit abbreviations

bcm	billion cubic metres	MBtu	million British thermal units
Gcal	gigacalorie	Mt	million tonnes
GCV	gross calorific value	MWh	megawatt hour
GW	gigawatt	PPP	purchasing power parity
GWh	gigawatt hour	t	metric ton = tonne = 1 000 kg
kb/cd	thousand barrels per calendar day	TJ	terajoule
kcal	kilocalorie	PJ	petajoule
kg	kilogramme	EJ	exajoule
kJ	kilojoule	TWh	terawatt hour
kWh	kilowatt hour	USD	United States dollar

# Definitions

### Coal

Coal includes all coal, both primary (including coking coal, steam coal and lignite) and derived fuels (including patent fuel, coke oven coke, gas coke, BKB, gas works gas, coke oven gas, blast furnace gas and other recovered gases). For presentational purposes, peat (including peat products) and oil shale are also included in this category, where applicable.

### Steam coal

Steam coal comprises anthracite, other bituminous coal and sub-bituminous coal.

### Crude oil

Crude oil comprises crude oil, natural gas liquids, refinery feedstocks and additives as well as other hydrocarbons.

### Oil products

Oil products comprises refinery gas, ethane, LPG, aviation gasoline, motor gasoline, jet fuel, kerosene, gas/diesel oil, fuel oil, naphtha, white spirit, lubricants, bitumen, paraffin waxes, petroleum coke and other oil products.

### Natural gas

Natural gas includes both "associated" and "non-associated" gas, excluding natural gas liquids.

### Nuclear

Nuclear shows the primary heat equivalent of the electricity produced by a nuclear power plant with an average thermal efficiency of 33%.

### Renewables

Renewables includes hydro, geothermal, solar PV, solar thermal, tide/wave/ocean, wind, municipal waste (renewable), primary solid biofuels, biogases, biogasoline, biodiesel, other liquid biofuels, non-specified primary biofuels and waste and charcoal.

### Hydro

Hydro shows the energy content of the electricity produced in hydro power plants. Hydro output excludes output from pumped storage plants.

### Solar photovoltaic (PV)

Solar PV electricity refers to electricity produced from solar photovoltaics, i.e. by the direct conversion of solar radiation through photovoltaic processes in semiconductor devices (solar cells), including concentrating photovoltaic systems.

### Wind

Wind electricity refers to electricity produced from devices driven by wind.

### Biofuels and waste

Biofuels and waste comprises solid biofuels, liquid biofuels, biogases, industrial waste and municipal waste. Biofuels are defined as any plant matter used directly as fuel or converted into fuels (e.g. charcoal) or electricity and/or heat. Included here are wood, vegetal waste (including wood waste and crops used for energy production), ethanol, animal materials/wastes and sulphite lyes. Municipal waste comprises wastes produced by residential, commercial and public services, that are collected by local authorities for disposal in a central location for the production of heat and/or power.



## Definitions

### Other (Energy source)

*Other* includes geothermal, solar, wind, tide/wave/ocean energy, electricity and heat. Unless the actual efficiency of geothermal and solar thermal is known, the quantity of geothermal and solar energy entering electricity generation is inferred from the electricity/heat production at geothermal and solar plants assuming an average thermal efficiency of:

- 10% for geothermal electricity
- 33% for solar thermal electricity
- 50% for geothermal heat
- 100% for solar thermal heat.

For solar PV, wind and tide/wave/ocean energy, the quantities entering electricity generation are equal to the electrical energy generated. Direct use of geothermal and solar heat is also included here. Electricity is accounted for at the same heat value as electricity in final consumption (i.e. 1 TWh = 3.6 PJ). Heat includes heat that is produced for sale and is accounted for in the transformation sector.

### Production

*Production* is the production of primary energy, i.e. coking coal, steam coal, lignite, peat, oil shale, crude oil, NGLs, natural gas, biofuels and waste, nuclear, hydro, geothermal, solar, wind and the heat from heat pumps that is extracted from the ambient environment. Production is calculated after removal of impurities (e.g. sulphur from natural gas).

### Imports and exports

*Imports and exports* comprise amounts having crossed the national territorial boundaries of the country, whether or not customs clearance has taken place.

#### a) Oil and natural gas

Quantities of crude oil and oil products imported or exported under processing agreements (i.e. refining on account) are included. Quantities of oil in transit are excluded. Crude oil, NGL and natural gas are reported as coming from the country of origin; refinery feedstocks and oil products are reported as coming from the country of last consignment. Re-exports of oil imported for processing within bonded areas are shown as exports of product from the processing country to the final destination.

#### b) Coal

Imports and exports comprise the amount of fuels obtained from or supplied to other countries, whether or not there is an economic or customs union between the relevant countries. Coal in transit is not included.

#### c) Electricity

Amounts are considered as imported or exported when they have crossed the national territorial boundaries of the country.

### International marine bunkers

*International marine bunkers* covers those quantities delivered to ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Consumption by ships engaged in domestic navigation is excluded. The domestic/international split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by fishing vessels and by military forces is also excluded.

## Definitions

### International aviation bunkers

*International aviation bunkers* covers deliveries of aviation fuels to aircraft for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/international split should be determined on the basis of departure and landing locations and not by the nationality of the airline. For many countries this incorrectly excludes fuel used by domestically owned carriers for their international departures.

### Stock changes

*Stock changes* reflects the difference between opening stock levels on the first day of the year and closing levels on the last day of the year of stocks on national territory held by producers, importers, energy transformation industries and large consumers. A stock build is shown as a negative number, and a stock draw as a positive number.

### Total energy supply (TES)

*Total energy supply (TES)* is made up of production + imports – exports – international marine bunkers – international aviation bunkers ± stock changes. For the world total, international marine bunkers and international aviation bunkers are not subtracted from TES.

### Transfers

*Transfers* includes both interproduct transfers, products transferred and recycled products (e.g. used lubricants which are reprocessed).

### Statistical differences

*Statistical differences* are essentially the difference between supply and demand. They include the sum of the unexplained statistical differences for individual fuels, as they appear in the basic energy statistics. They also include the statistical differences that arise because of the variety of conversion factors in the coal and oil columns.

### Electricity plants

*Electricity plants* refers to plants which are designed to produce electricity only. If one or more units of the plant is a CHP unit (and the inputs and outputs cannot be distinguished on a unit basis) then the whole plant is designated as a CHP plant. Both main activity producers and autoproducer plants are included here.

### Oil refineries

*Oil refineries* shows the use of primary energy for the manufacture of finished oil products and the corresponding output. Thus, the total reflects transformation losses. In certain cases the data in the total column are positive numbers. This can be due to either problems in the primary refinery balance or to the fact that the IEA uses regional net calorific values for oil products.

### Other transformation

*Other transformation* covers non-specified transformation not shown elsewhere, such as the transformation of primary solid biofuels into charcoal.

### Energy industry own use

*Energy industry own use* contains the primary and secondary energy consumed by transformation industries for heating, pumping, traction and lighting purposes [ISIC 05, 06, 19 and 35, Group 091 and Classes 0892 and 0721].

**Losses**

Losses include losses in energy distribution, transmission and transport.

**Total final consumption (TFC)**

Total final consumption (TFC) is the sum of consumption by the different end-use sectors and also includes non-energy use. Backflows from the petrochemical industry are not included in final consumption.

**Industry**

Industry consumption is specified by sub-sector as listed below. Energy used for transport by industry is not included here but is reported under transport. Non-energy use in industry is excluded from industry and reported separately:

- Mining (excluding fuels) and quarrying [ISIC Divisions 07 and 08 and Group 099]
- Construction [ISIC Divisions 41 to 43]
- Iron and steel industry [ISIC Group 241 and Class 2431]
- Chemical and petrochemical industry [ISIC Divisions 20 and 21] excluding petrochemical feedstocks
- Non-ferrous metals basic industries [ISIC Group 242 and Class 2432]
- Non-metallic minerals such as glass, ceramic, cement, etc. [ISIC Division 23]
- Transport equipment [ISIC Divisions 29 and 30]
- Machinery comprises fabricated metal products, machinery and equipment other than transport equipment [ISIC Divisions 25 to 28]
- Food and tobacco [ISIC Divisions 10 to 12]
- Paper, pulp and printing [ISIC Divisions 17 and 18]
- Wood and wood products (other than pulp and paper) [ISIC Division 16]
- Textile and leather [ISIC Divisions 13 to 15]
- Non-specified (any manufacturing industry not included above) [ISIC Divisions 22, 31 and 32].

**Transport**

Transport includes all fuels used for transport [ISIC Divisions 49 to 51]. It includes transport in industry and covers domestic aviation, road, rail, pipeline transport, domestic navigation and non-specified transport. Fuel used for ocean, coastal and inland fishing (included under fishing) and military consumption (included in other non-specified) are excluded from transport. Please note that international marine and international aviation bunkers are also included here for world total. Non-energy use in transport is excluded from transport and reported separately.

**Other (Energy final consumption)**

Other covers residential, commercial and public services [ISIC Divisions 33, 36-39, 45-47, 52, 53, 55, 56, 58-66, 68-75, 77-82, 84 (excluding Class 8422), 85-88, 90-99], agriculture/forestry [ISIC Divisions 01 and 02], fishing [ISIC Division 03] and non-specified consumption.

**Non-energy use**

Non-energy use covers those fuels that are used as raw materials in the different sectors and are not consumed as a fuel or transformed into another fuel. Non-energy use also includes petrochemical feedstocks. Non-energy use is shown separately in final consumption under the heading non-energy use.

**World**

OECD<sup>1</sup> Total, Africa, Non-OECD Americas, Non-OECD Asia (excluding China), China (People's Republic of China and Hong Kong, China), Non-OECD Europe and Eurasia, Middle East, World aviation bunkers and World marine bunkers. It is also the sum of Africa, Americas, Asia, Europe, Oceania, World aviation bunkers and World marine bunkers.

**Africa**

Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, the Republic of the Congo (Congo), Côte d'Ivoire, the Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, the Kingdom of Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Réunion (until 2010), Rwanda, Sao Tome and Principe, Senegal, the Seychelles, Sierra Leone, Somalia, South Africa, South Sudan (from 2012), Sudan, the United Republic of Tanzania (Tanzania), Togo, Tunisia, Uganda, Zambia, Zimbabwe.

**Americas**

Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Belize, Bermuda, the Plurinational State of Bolivia (Bolivia), Bonaire (from 2012), the British Virgin Islands, Brazil, Canada, the Cayman Islands, Chile, Colombia, Costa Rica<sup>2</sup>, Cuba, Curaçao<sup>2</sup>, Dominica, the Dominican Republic, Ecuador, El Salvador, the Falkland Islands (Malvinas), Guatemala, French Guiana (until 2010), Grenada, Guadeloupe (until 2010), Guyana, Haiti, Honduras, Jamaica, Martinique (until 2010), Mexico, Montserrat, Nicaragua, Panama, Paraguay, Peru, Puerto Rico<sup>3</sup>, Saba (from 2012), Saint Kitts and Nevis, Saint Lucia, Saint Pierre and Miquelon, Saint Vincent and the Grenadines, Sint Eustatius (from 2012), Sint Maarten (from 2012), Suriname, Trinidad and Tobago, the Turks and Caicos Islands, the United States, Uruguay, the Bolivarian Republic of Venezuela (Venezuela).

**Asia (from 1990)**

Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, the People's Republic of China, Cyprus<sup>3</sup>, Georgia, Hong Kong (China), India, Indonesia, the Islamic Republic of Iran, Iraq, Israel<sup>4</sup>, Japan, Jordan, the Democratic People's Republic of Korea, Korea, Kazakhstan, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Macau (China), China, Malaysia, the Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, the Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, the Syrian Arab Republic, Tajikistan, Chinese Taipei, Thailand, Timor-Leste, Turkey, Turkmenistan, the United Arab Emirates, Uzbekistan, Viet Nam, and Yemen.

**Europe (from 1990)**

Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France<sup>5</sup>, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Italy, Kosovo<sup>6</sup>, Latvia, Lithuania, Luxembourg, Malta, the Republic of Moldova (Moldova), Montenegro, the Netherlands, the Republic of North Macedonia, Norway, Poland, Portugal, Romania, the Russian Federation, Serbia<sup>7</sup>, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Ukraine, the United Kingdom.

**Oceania**

Australia, New Zealand, Cook Islands, Fiji, French Polynesia, Kiribati, New Caledonia, Palau, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Vanuatu.

## Geographical coverage

### OECD<sup>1</sup>

Australia, Austria, Belgium, Canada, Chile, Colombia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel<sup>4</sup>, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States.

### OECD Americas

Canada, Chile, Colombia, Mexico, the United States.

### OECD Asia Oceania

Australia, Israel<sup>4</sup>, Japan, Korea, New Zealand.

### OECD Europe

Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom.

### The IEA and Accession/Association countries

IEA member countries: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States; Accession countries: Chile, Colombia, Israel<sup>4</sup> and Lithuania; Association countries: Brazil, the People's Republic of China, India, Indonesia, Morocco, Singapore, South Africa, Thailand.

### Middle East

Bahrain, the Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, United Arab Emirates and Yemen.

### Non-OECD Europe and Eurasia

Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus<sup>3</sup>, Georgia, Gibraltar, Kazakhstan, Kosovo<sup>6</sup>, Kyrgyzstan, Malta, the Republic of Moldova (Moldova), Montenegro, the Republic of North Macedonia, Romania, Russian Federation, Serbia<sup>7</sup>, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, the Former Soviet Union and the Former Yugoslavia.

### China

People's Republic of China and Hong Kong (China).

### Non-OECD Asia excluding China

Bangladesh, Brunei Darussalam, Cambodia (from 1995), India, Indonesia, Democratic People's Republic of Korea, Lao People's Democratic Republic, Malaysia, Mongolia (from 1985), Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Chinese Taipei, Thailand, Viet Nam and Other non-OECD Asia.

### Non-OECD Americas

Argentina, the Plurinational State of Bolivia (Bolivia), Brazil, Costa Rica<sup>9</sup>, Cuba, Curaçao<sup>2</sup>, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Suriname (from 2000), Trinidad and Tobago, Uruguay, the Bolivarian Republic of Venezuela (Venezuela) and Other non-OECD Americas.

## Geographical coverage

1. OECD includes Estonia, Latvia, Lithuania and Slovenia starting in 1990. Prior to 1990, Estonia, Latvia and Lithuania are included in Former Soviet Union and Slovenia is included in Former Yugoslavia.

2. The Netherlands Antilles was dissolved on 10 October 2010, resulting in two new constituent countries, Curaçao and Sint Maarten, with the other islands joining the Netherlands as special municipalities. From 2012 onwards, data now account for the energy statistics of Curaçao Island only. Prior to 2012, data remain unchanged and still cover the entire territory of the former Netherlands Antilles.

3. Note by Turkey:

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union member states of the OECD and the European Union:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

4. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

5. Data for the overseas departments are included in Europe starting with 2011, and in other regions as appropriate (America or Africa) until 2010.

6. This designation is without prejudice to positions on status, and is in line with United Nations Security Council Resolution 1244/99 and the Advisory Opinion of the International Court of Justice on Kosovo's declaration of independence.

7. Serbia includes Montenegro until 2004 and Kosovo until 1999.

8. Natural gas and electricity data for Puerto Rico are included under Other non-OECD Americas, except for input to and output to electricity and heat generation, included under the United States starting with 2017 data.

9. Data for Costa Rica, that joined the OECD in May 2021, are not included in the OECD aggregate in this publication.

Note: The countries listed above are those for which the IEA Secretariat has direct statistics contacts. This document is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. In this publication 'country' refers to country, economy or territory, as the case may be.

# Plan de la présentation

- Introduction et objectifs
- Supply, transformation, final consumption, balances, émissions, R&D, indicateurs, facteurs de conversion, glossaire
- ***Conclusion***

# Conclusions

- Les valeurs rapportées pour la **production** sont semblables à celles rapportées par BP à moins de 1% près!
- Les valeurs rapportées pour la **consommation** diffèrent cependant car BP emploie l'énergie primaire et l'IEA l'énergie secondaire (finale)!
- Pour apparier les deux, il faut consulter la page 28-29 de cette présentation (Energy balances)

# Conclusions

- Dans les stats de l'IEA, il n'y a **pas** de comparaison directe avec les années précédentes;
- La consommation d'énergie mondiale et la consommation d'électricité ont augmenté de **1%** chacune en 2019 (2018);
- Les données montrent que la consommation a plus que doublé depuis 1971;
- Le secteur de la production d'électricité est responsable de plus de 50% des émissions de GES, donc un effort intense est requis.



**Merci de votre attention !**

Lorsque cette capsule de formation est présentée en asynchrone (PDF récupérable sur le site du cours), si vous avez des questions à formuler, veuillez les poser par écrit sur le forum et spécifier le nom et le numéro de la présentation. Nous vous répondrons le plus rapidement possible.

# Période de questions

