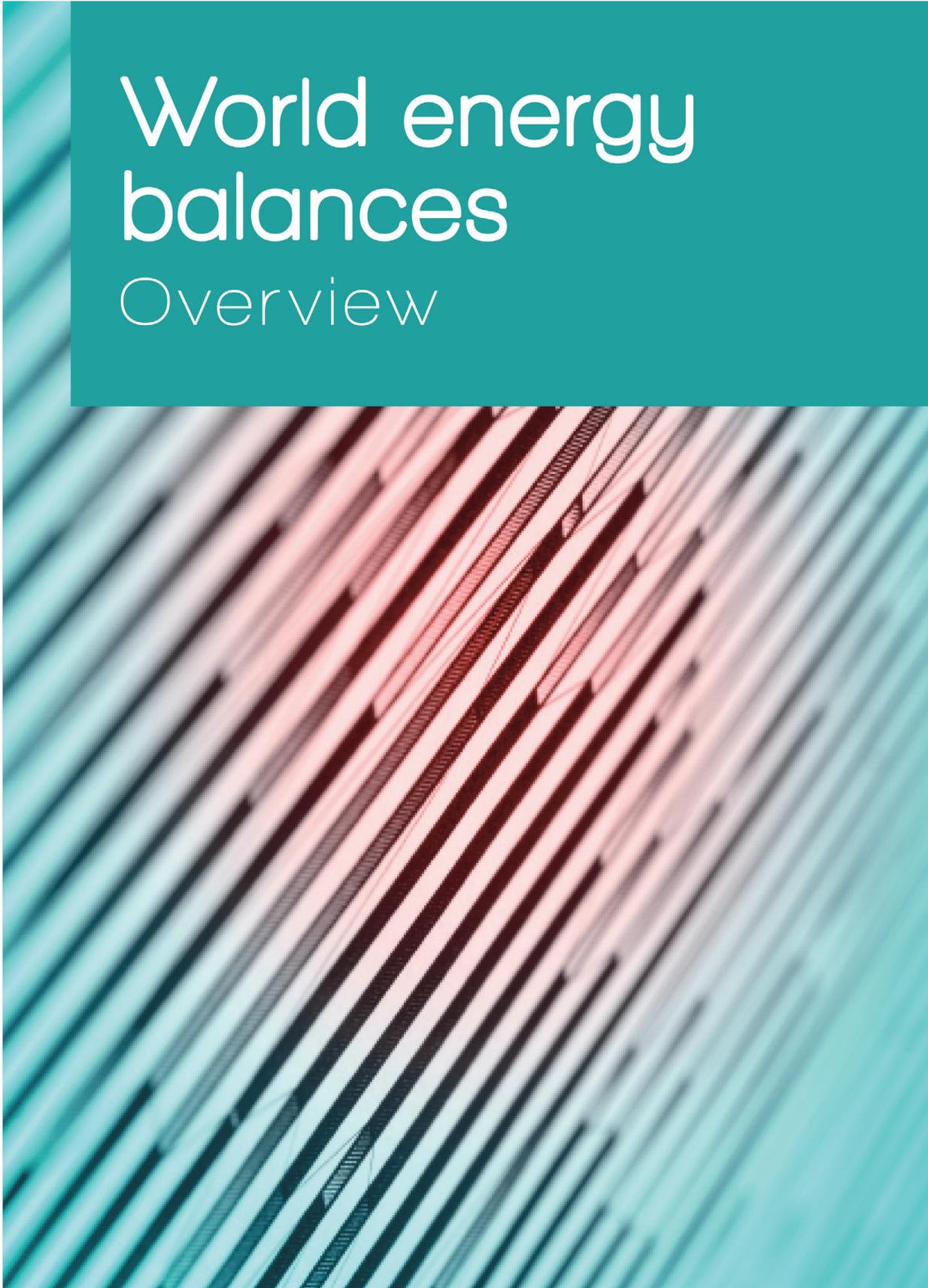


Statistics

World energy balances

Overview



iea

2019

The following analysis is an overview from the publication *World Energy Balances 2019* which can be purchased from the IEA webstore at <https://webstore.iea.org>. The data can be purchased at <http://data.iea.org>.

Please note that we strongly advise users to read definitions, detailed methodology and country specific notes which can be found at http://wds.iea.org/wds/pdf/worldbal_documentation.pdf

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WORLD ENERGY BALANCES: AN OVERVIEW

Global trends

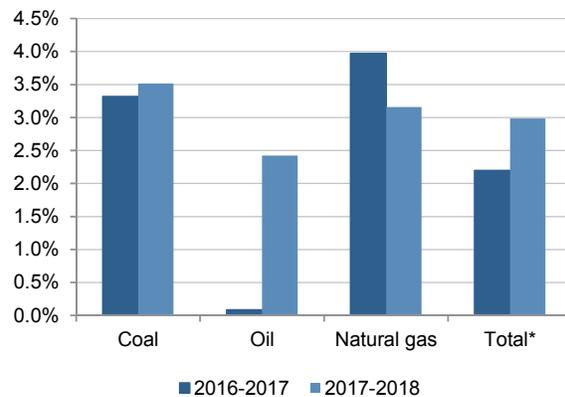
This overview provides a detailed look at energy developments based on complete supply and demand data for 2017 for more than 160 countries and regions, and where available provisional official supply or production data for 2018.

In 2017, global energy demand as measured by TPES increased significantly compared to 2016 (+1.9%) to a little less than 14 000 Mtoe. This is mainly driven by growth of demand in non-OECD countries (+2.7%), whereas energy demand rose at a slower pace in OECD countries (+0.6%). However, energy demand growth accelerated in 2018 in OECD countries (+1%), as discussed in more detail in the OECD section.

Production

For 2018, global country level production data is preliminary and restricted to fossil fuels. Based on these data, growth in the production of fossil fuels increased for the second year in a row and even accelerated (+3.0% in 2018 after 2.2% in 2017 - Figure 1). This was driven by a surge in coal production for the second year in a row after a strong decline (+3.5% in 2018 after +3.3% in 2017 and -6.0% in 2016) but also oil which grew strongly in 2018 after being flat in 2017 (+2.4% and +0.1% respectively). Natural gas production continued to grow, but at a slightly slower pace than had been the case in the previous year (+3.2% in 2018 after +4.0% in 2017). The increase in coal production was particularly strong in many regions: non-OECD Asia excluding China (+56 Mtoe, +9.3%), China (+79 Mtoe, +4.4%), and non-OECD Europe and Eurasia (+19 Mtoe, +6.0%). They more

Figure 1. Annual average change in global fossil fuels production by fuel



* In this graph total fossil fuels exclude peat and oil shale.

than compensated for the decline in non-OECD Americas (- 5 Mtoe, -7.9%), and in OECD (-17 Mtoe, -2.0%).

Oil production increased in all regions in 2018 except non-OECD Asia and non-OECD Americas, particularly in OECD (+108 Mtoe, +9.5%) and the Middle East (+20 Mtoe, +1.3%). As for natural gas, growth in OECD and Middle East (+7.1% and +3.6% respectively in 2018, +100 Mtoe combined) as well as in Africa (+2.7%, +5 Mtoe) exceeded the decline in non-OECD Asia including China (-1.4%, -5 Mtoe).

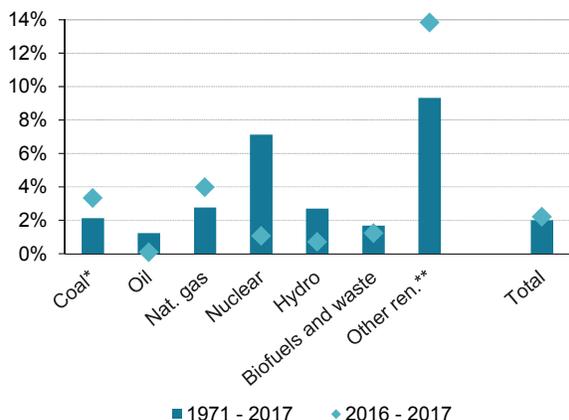
The remainder of this section looks at the detail of 2017 world production and use.

World energy production was 14 035 Mtoe in 2017 – a 2.2% increase compared to 2016 (Figure 2). This increase was driven by coal and natural gas, both increasing by more than 120 Mtoe in 2017, and

renewables other than hydro and biofuels, which grew by slightly more than 30 Mtoe. Oil production was stable (+0.1%), increasing by 3.6 Mtoe between 2016 and 2017.

Fossil fuels accounted for 81.3% of production in 2017, as was the case in 2016. Together the production of these three fossil fuels grew by 2.2% in 2017, a rate identical to all fuels growth altogether.

Figure 2. Annual average change in global energy production by fuel



* In this graph peat and oil shale are aggregated with coal.
 ** Includes geothermal, solar thermal, solar photovoltaic and wind.

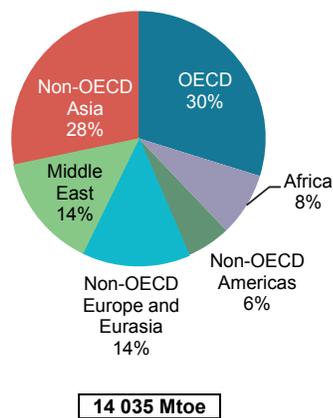
Production increased for all non-fossil sources, but for most those of coal and natural gas offset this growth. Biofuels and waste increased their production in 2017 by +1.2%, half the rate as in 2016. Their share in the world energy production decreased by 0.4 percentage points.

Hydro slightly increased in 2017 (+0.7%), providing 2.5% of global production in 2017, and setting a record with 351 Mtoe. Solar PV, wind, geothermal, solar thermal increase of production accelerated in 2017 (+34.8%, +17.7%, +7.0%, +3.4% respectively) but still accounted for less than 2% of global primary energy production together. Finally, nuclear production increased by 1.1% in 2017 compared to 2016, providing the same share of energy at global level in both years (4.9%).

At a regional level, the contribution to energy production was almost identical in 2016 and 2017. OECD was the largest energy-producing area just ahead of non-OECD Asia¹ in 2017 (Figure 3), as has been the

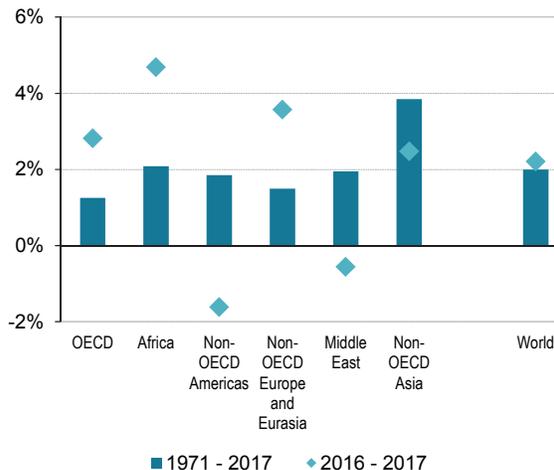
1. In this section, non-OECD Asia includes China region unless otherwise specified.

Figure 3. Total production by region 2017



case since 2010. OECD economies produced 30% of global energy, whereas non-OECD Asia accounted for 28% as in 2016. In the OECD as a whole production rose by +2.8% (Figure 4), reaching 4 181 Mtoe in 2017. With 3 971 Mtoe in 2017, non-OECD Asia increased its production of energy by 2.5%. Notwithstanding a slight decline in 2017 (-0.6%), the Middle East remained the third biggest producing region, but with a 3.6% growth, non-OECD Europe and Eurasia is catching up (respectively 2 032 Mtoe and 1 924 Mtoe in 2017).

Figure 4. Annual average change in energy production by region



In OECD the four biggest producers all increased their energy production in 2017, by 3% to 6%. With a 4% growth, the United States remained the biggest

energy producer in OECD by far, reaching 1 993 Mtoe. It is the third biggest production in history, after the records reached in 2015 and 2014, when production was above 2 000 Mtoe. In Canada, the second biggest producer in the OECD, production increased by 6% and reached a record, at 510 Mtoe (+30 Mtoe compared to 2016). In Australia, the third biggest OECD producer, production also reached a record, above 400 Mtoe for the first time. Together with Norway, the 4th energy producer of the Organisation, those countries increased their energy production in 2017 by 130 Mtoe. Energy production grew in 24 of the 36 member countries of the OECD.

In non-OECD Asia, energy production significantly increased (+2.5%), at 3 971 Mtoe in 2017, boosted by increases in the People's Republic of China (+3.8%) and Indonesia (+3.2%). In the People's Republic of China, energy production in 2017 reached almost 2 450 Mtoe, the fourth biggest production in its history (the record being set in 2015 with 2 514 Mtoe). This increase is mainly due to coal (+67 Mtoe, +3.9%), followed by solar PV, wind and tide/wave/ocean (+10.4 Mtoe, +21.2% over 2016), natural gas and nuclear. In Indonesia, the increase of energy production is mainly due to coal (+13.9 Mtoe, +5.6%) followed by geothermal (+3.6 Mtoe, +19.8%).

In 2017, the Middle East still ranked third, with 2 032 Mtoe of energy produced. Nonetheless, alongside non-OECD Americas it is one of only two regions where energy production decreased in 2017. Production of energy in the Middle East declined by 0.6%, the drop of oil production in some of the biggest producers (Saudi Arabia, UAE, Kuwait) not being compensated by the growth in others (Iran, Iraq), nor by the general regional increase of natural gas production.

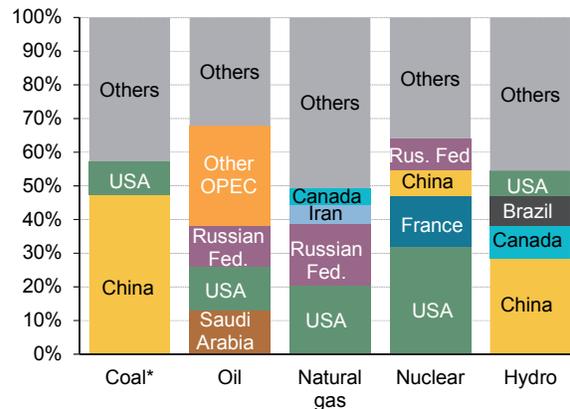
With 1 924 Mtoe, non-OECD Europe and Eurasia produced 3.6% more energy in 2017 than in 2016 and ranked 4th among the energy-producing regions.

Though still ranking 5th with 1 135 Mtoe of energy produced in 2017, Africa enjoyed the biggest growth of all (+4.7%).

In non-OECD Americas countries energy production decreased (-1.6%). The region produced 792 Mtoe of energy in 2017, its lowest level since 2010 due to simultaneous decreases in some of its biggest energy producers, Venezuela (-10.3%), Argentina (-1.9%), Colombia (-0.7%). Growth in Brazil did not offset these reductions.

The IEA family (IEA member economies, Association and Accession countries) represented 54% of the global energy production in 1971, and 58% in 2017.

Figure 5. Largest producers by fuel in 2017



* In this graph peat and oil shale are aggregated with coal.

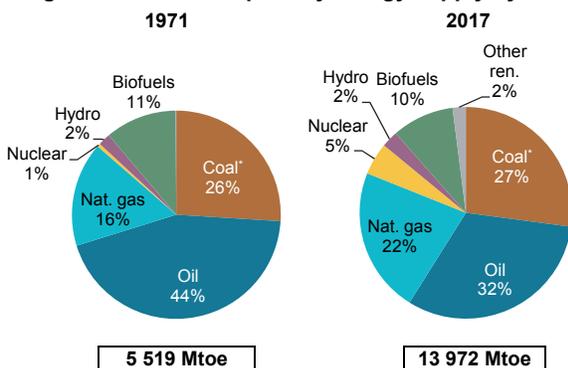
While energy production of all fuels is very concentrated with over half of production concentrated in less than five countries (and in some cases only two countries), there is great variation in the basket of countries concerned (Figure 5). China was not far from producing half of the world coal in 2017, and 29% of hydro. The United States and France combined produced almost 50% of all nuclear. Saudi Arabia, the Russian Federation and the United States contributed slightly less than 40% of the world crude oil – these last two also accounting for 40% of the world natural gas. This concentration is usually stable; the only notable change in 2017 compared to 2016 is that Canada replaced Qatar as the 4th biggest natural gas producer.

Total Primary Energy Supply (TPES)

Between 1971 and 2017, world total primary energy supply (TPES) increased by more than 2.5 times (from 5 519 Mtoe to 13 972 Mtoe) and its structure changed (Figure 6). The two most striking changes affected the relative shares of oil and gas. While still the dominant fuel in 2017, oil fell from 44% to 32% of TPES. As for natural gas, it grew from 16% to 22%. The share of coal is one percentage point higher in 2017 compared to 1971 (respectively 27% and 26%). However, it has fluctuated significantly during that period, increasing constantly between 1999 and 2011, influenced mainly by increased consumption in China. In 2011 it reached its highest level (29%), peaking at 71% of TPES in China. It has declined

since then and represented 27% of world TPES in 2017. Meanwhile nuclear grew from 0.5% to 4.9%.

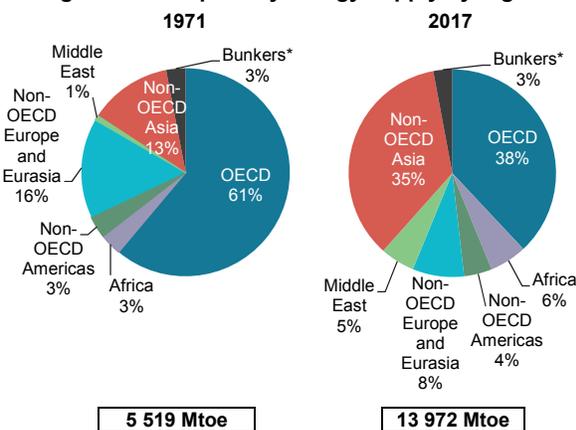
Figure 6. World total primary energy supply by fuel



* In this graph peat and oil shale are aggregated with coal.

Energy demand has evolved differently across the regions between 1971 and 2017. The OECD's share of global TPES fell from 61% in 1971 to 38% in 2017 (Figure 7). It is now almost on par with non-OECD Asia, where energy demand grew seven-fold, reaching 4 955 Mtoe in 2017, and whose share of TPES almost tripled over the period, from 13% in 1971 to 36% in 2017. Though its share of global energy demand nearly halved between 1971 and 2017 (from 15.5% to 8.0%), non-OECD Europe and Eurasia remained the third biggest energy-consuming region, with more than 1 100 Mtoe TPES. It was followed by Africa, where energy demand over the period has multiplied by more than four, reaching 812 Mtoe in 2017, Middle East and non-OECD Americas.

Figure 7. Total primary energy supply by region

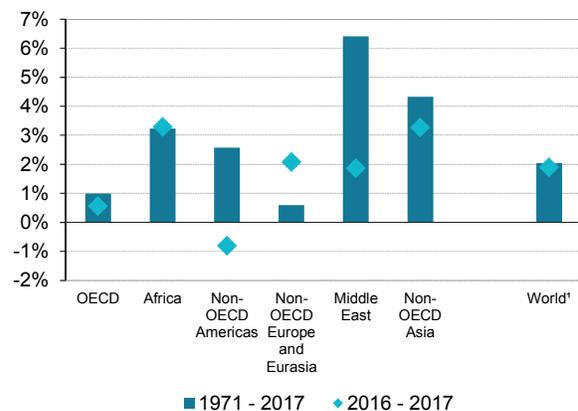


* Includes international marine and aviation bunkers.

Between 2016 and 2017, global TPES increased by 260 Mtoe (+1.9%), reaching 13 972 Mtoe. TPES

increased mostly in non-OECD Asia and Africa (+3.3% in each), non-OECD Europe and Eurasia (+2.1%) and Middle East (+1.9%). It slightly increased (+0.6%) in OECD but decreased in non-OECD Americas (Figure 8, -0.8%) for the third year in a row. The IEA family group accounted for 72.1% of TPES in 2017 and exceeded 10 000 Mtoe for the first time.

Figure 8. Annual average change in TPES by region



* World also includes international marine and aviation bunkers.

Non-OECD countries account for a continuously growing share of the world energy consumption (72% in 2017). In 2017, People's Republic of China accounted for 22% of global TPES while the United States accounted for 16% (Table 1). India and the Russian Federation ranked third and fourth respectively. Japan, the second largest OECD consuming country, was in fifth position. Together, these five countries accounted for more than half of the global TPES in 2017. The 2017 top ten countries represented 62% of global energy demand, as opposed to 56% in 1971. Seven of them (China, the United States, India, Russian Federation and previously Soviet Union, Japan, Germany and Canada) have been amongst the ten major energy consumers for the whole period.

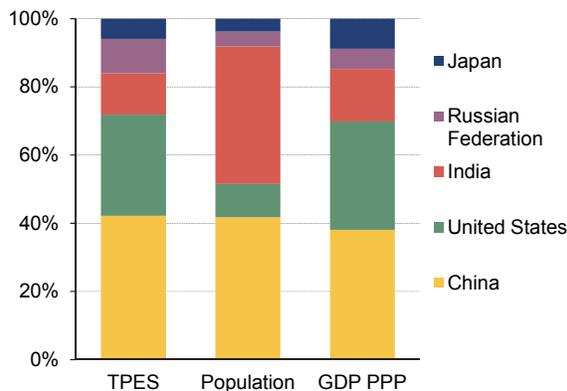
In 2017, the top five countries in terms of TPES accounted for less than half of the world GDP², and world population (48% and 44% respectively) but consumed 52% of total world energy. However, the relative shares of TPES, population and GDP of these five countries significantly varied from one to another (Figure 9).

2. In this section, GDP refers to GDP using purchasing power parities.

Table 1. TPES – top ten countries in 2017

Country	TPES (Mtoe)	Share in world TPES	
		2017	1971
People's Rep. of China	3 063	22%	7%
United States	2 155	16%	29%
India	882	6%	3%
Russian Federation	732	5%	N/A
Japan	432	3%	5%
Germany	311	2%	6%
Brazil	290	2%	1%
Canada	289	2%	0.3%
Korea	282	2%	3%
Islamic Republic of Iran	262	2%	3%
Rest of the world	5 274	38%	44%
World	13 972	100%	100%

Figure 9. Top five energy consumers: 2017 relative shares*



* Relative shares within the top five, which differ from shares in the world total.

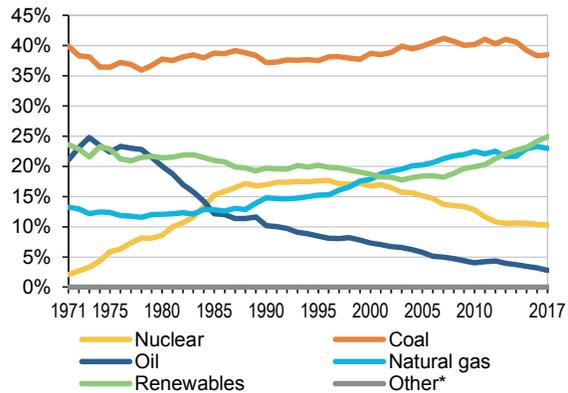
The United States consumed almost 16% of world energy, with 4.3% of the world’s population. Conversely, China and India consumed 22% and 6% of global energy respectively, but each accounted for 18% of the global population. The Russian Federation and Japan also consumed significant amounts of energy in 2016 (5.2% and 3.1% of global TPES respectively). However, energy intensities differed significantly.

To produce the same amount of wealth, as measured by GDP in PPP, the Russian Federation consumed in 2017 almost 227 Mtoe per billion US dollars, 2.5 times as much energy as Japan (the country with the lowest energy intensity of the five top energy consumers), and twice as much as India. Such comparisons reflect the importance of specific industries in each country, and not just relative efficiency in the use of energy.

Power generation from coal was still dominant by far in 2017 and its share increased again in 2017 after a three-year ebb, reaching 38.5% of the electricity produced globally (Figure 10). Renewables come second

in the electricity mix, as has been the case since 2013, and almost reached 25% of the mix in 2017. Though hydro is still dominant, its share in the power mix has decreased since the 1970s and recent growth is entirely due to the development of wind and solar PV and to a smaller extent combustible renewables. Generation from gas grew slowly to reach 15% in 1990; since then steady increases have seen it grow to 23.3% in 2016, but it decreased slightly to 23.0% in 2017. Nuclear production had steadily increased in the 1970s and 1980s, before plateauing at around 17% of electricity production and then declining continuously since the 2000s to reach approximately 10%. Power production from oil peaked at almost 25% of power production in 1973, just before the oil crisis, and has been declining since then. From being the second fuel used for electricity production after coal, it has become the fifth, just below 3% of the global electricity generation in 2017. Whilst globally the use of oil for electricity generation has fallen sharply, it still accounts for over 90% of electricity generation in a number of countries including Lebanon, Cyprus, or South Sudan. Oil and natural gas combined provided 100% of power production in countries such as Bahrain, Brunei Darussalam, Oman, Qatar and Trinidad and Tobago.

Figure 10. World electricity generation mix 1971-2017



* Other includes non-renewable waste and non-renewable heat.

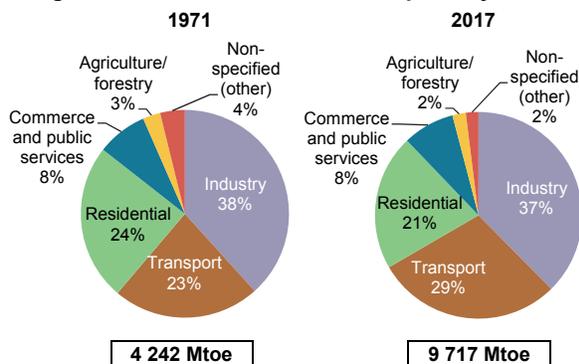
Total Final Consumption (TFC)

Between 1971 and 2017, total final consumption (TFC) was multiplied by 2.3 (Figure 11). The share of energy use of most sectors³ has been stable – for commerce and services or industry for instance. However, energy use in transport significantly increased,

3. In this section, each sector of final consumption includes non-energy use.

from 23% of TFC in 1971 to 29% in 2015-2017. Nevertheless, in 2017 industry remained the largest consuming sector, only one percentage point lower than in 1971 (37%). The residential sector ranked third in 2017 (21%).

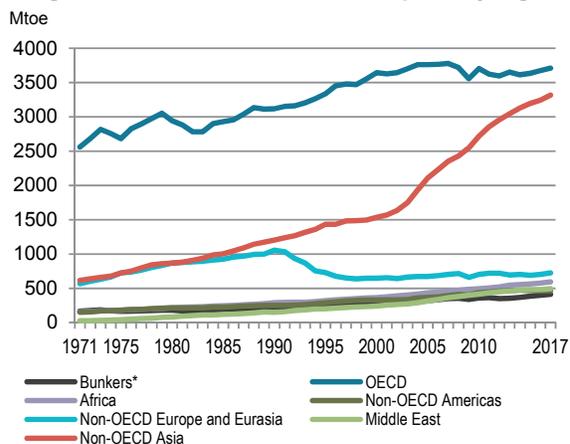
Figure 11. World total final consumption by sector



Total final consumption has soared in non-OECD Asia including China since the early 2000s to account for 34% of global TFC in 2017 and a level of 3 317 Mtoe. In the OECD the generally increasing trend came to an end with the 2008 global economic crisis, with total final consumption oscillating around a plateau of 3 600 Mtoe (38% of global TFC,

Figure 12) for a number of years. It has picked up again in 2014 and OECD TFC reached 3 711 Mtoe in 2017, its highest level since 2008.

Figure 12. World total final consumption by region



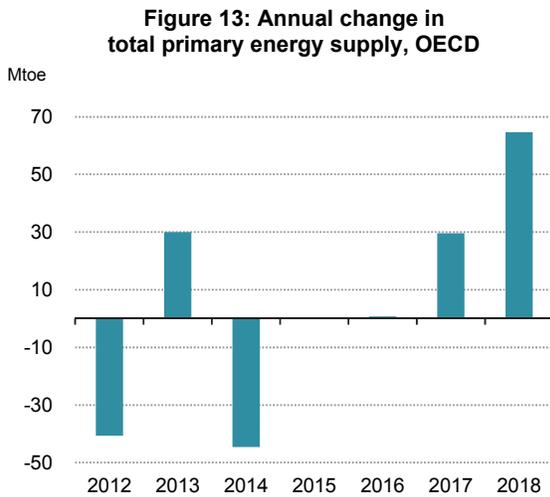
* Includes international marine and aviation bunkers.

The following sections briefly describe OECD trends up to 2018 and 1971-2017 energy trends in seven different regions of the world: OECD, Africa, non-OECD Americas, non-OECD Asia, non-OECD Europe and Eurasia, and the Middle East.

OECD

Key supply and CO₂ emissions trends in 2018

After a period of decrease at the start of the decade, 2018 showed an increase in Total Primary Energy Supply (TPES) for the OECD region for the second year in a row: while 2017 had already shown a 0.6% growth, for 2018 the increase rate doubled, reaching +1.2% (Figure 13). The net increase was almost 70 Mtoe, equivalent to the energy consumption of a country like the Netherlands. It is the first time since the first decade of the 2000s that TPES increased for two consecutive years.

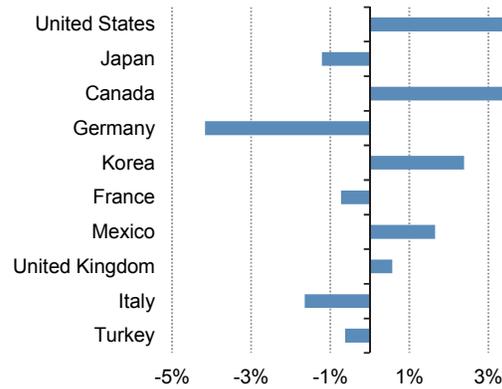


Overall, the TPES for the OECD region in 2018 was equal to 5 374 Mtoe, the highest value since 2010. At the global scale, OECD represents almost two fifths of total energy supply.

Within the general trend, the top energy-consuming countries showed different TPES patterns in 2018 (Figure 14). The United States alone grew by more than 70 Mtoe (more than 1% of OECD's TPES): natural gas represented more than two thirds of such growth, mostly driven by power generation and residential consumption; oil and renewables accounted for the remaining part. Canada increased too, by almost 4%, reaching an all-time high of 300 Mtoe; similarly Mexico, Korea, Australia and Poland.

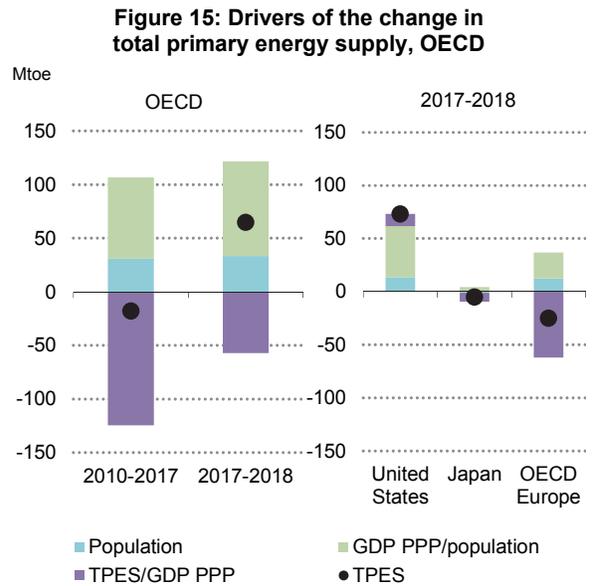
On the other hand, several countries showed decreases in TPES: in Europe, Germany (-4%) reached its lowest level of consumption since the 1970s;

Figure 14: Change in TPES by country: 2017-2018, largest ten energy-consuming OECD countries



Belgium (-5%), Portugal (-4%), Greece, Netherlands and Sweden (-3%), Italy and Norway (-2%); Japan, France, Turkey, New Zealand showed decreases too.

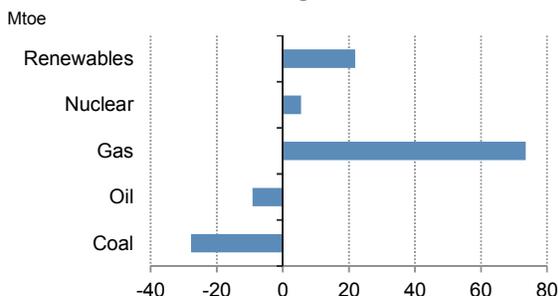
Economic output has been the largest driver of the increase in energy consumption in the OECD region for 2018. In contrast with earlier years, improvements in energy efficiency have not been able to offset the growth in energy demand that took place in 2018 (Figure 15).



While trends in OECD Europe and Japan were in line with recent years, the United States in 2018 for the first time ever registered an increase in energy intensity at the same time as a 3% increase in GDP. The extreme weather conditions that affected North America during winter may have played a role in this effect.

Among the different energy sources, natural gas grew the most in the OECD, with additional 70 Mtoe (Figure 16): gas supply increased by 10% or more in the United States, Canada, Mexico and Korea; however it decreased in some other countries, partially due to a drop in electricity generation: Japan (-4%), Germany (-5%) and Italy (-3%).

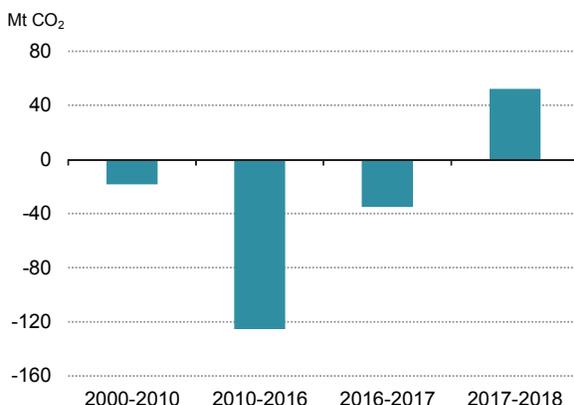
Figure 16: Total primary energy supply by source: 2018 change, OECD



The decrease in coal supply, common to almost all OECD countries, was compensated by the increase in renewable energy; the changes in power generation from these two sources reflect the changes in supply.

Despite the increase in renewable energy and fall in coal in 2018, low-carbon energy sources did not keep pace with gas growth, resulting in a 0.5% increase in energy-related carbon dioxide emissions (Figure 17). After a 1% average annual drop in the 2010-2016 period, driven by improvements in energy efficiency and penetration of renewables, in 2018 emissions started to grow again in OECD; since the Great Recession, this had only happened in 2013.

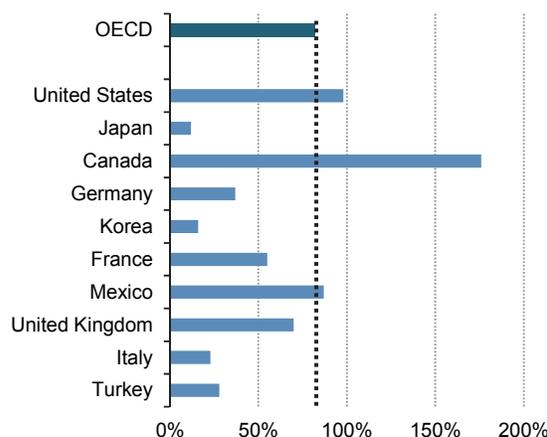
Figure 17: Annual change in CO₂ emissions for OECD



Despite the overall increase in emissions, mostly driven by the United States, Canada and Korea, several countries showed net decreases, most notably Japan, Germany and France.

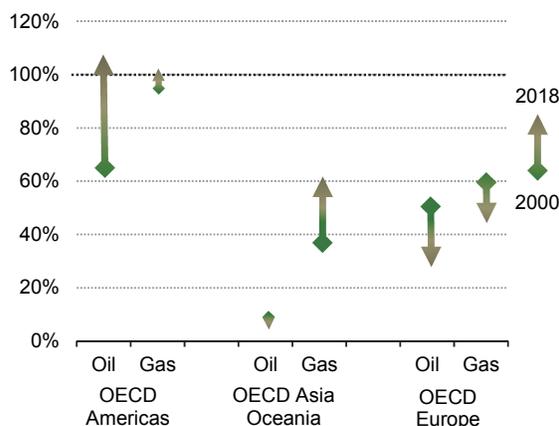
From an energy security point of view, the increase in TPES did not threaten the region as a whole: the overall energy self-sufficiency grew by 3 percentage points in 2018 reaching the value of 82% (Figure 18). The 70 Mtoe increase in energy demand was more than offset by a growth in production that touched 200 Mtoe.

Figure 18: Self sufficiency in 2018: largest ten OECD countries



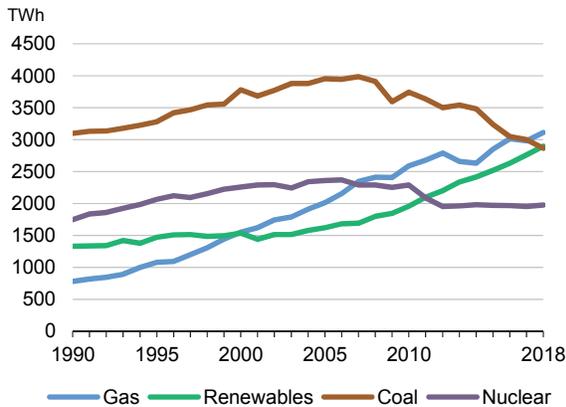
Due to annual average growth rates of oil and gas production equal to 9% and 5% in the United States since 2010, OECD Americas reached in 2018 its overall self-sufficiency; OECD Europe, Asia and Oceania instead were still far from it, both at around 60%. While Asia and Oceania saw improvements for gas thanks to the increase in Australian production - 2.5 times since 2000 - Europe decreased both oil and gas self-sufficiency, with a drop in production not compensated by the decrease in TPES (Figure 19).

Figure 19: Oil and gas self-sufficiency by region: change between 2000 and 2018



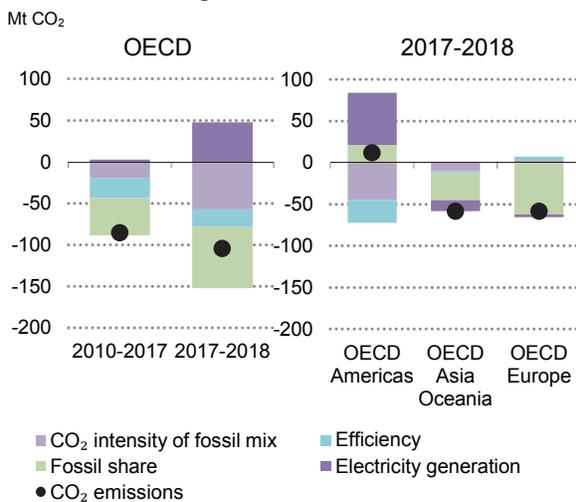
Power generation was responsible for around half of the OECD growth in natural gas supply. In 2018, gas overtook coal as the top fuel for electricity generation, with more than 3 000 TWh generated (Figure 20).

Figure 20: Electricity generation by source, OECD



After growing at an average annual rate of 5% since 2010 across all OECD regions, in 2018 renewables generation reached the same levels as coal for the first time, which dropped consistently in most OECD countries. As a result of the penetration of gas and renewable sources in place of coal, the carbon intensity of electricity generation for the OECD decreased by 6% between 2017 and 2018, with total emissions from electricity decreasing by 100 Mt CO₂.

Figure 21: Drivers of CO₂ emissions from electricity generation, OECD



While 2018 total electricity generation remained stable in Europe, Asia and Oceania, growth in the Americas was 3%, reaching pre-crisis levels. The increase in gas generation (12%), responsible for more than 80% of the total increase, outpaced renewables

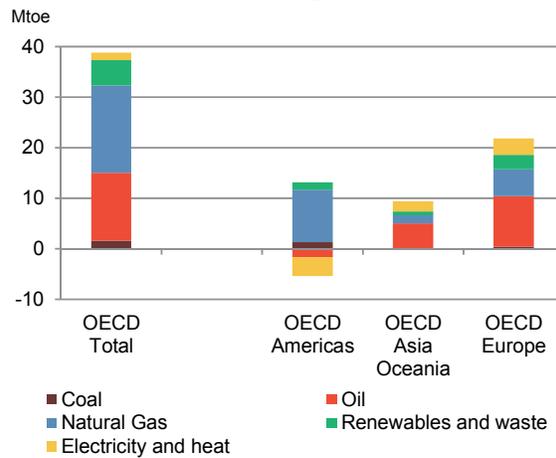
growth and caused the share of fossil fuels in electricity generation to increase.

More severe temperatures both in winter and summer contributed to the increase in overall electricity production in the United States and Canada; however, the combined effects of a lower carbon intensity of the fossil mix and a greater efficiency contained the emissions growth in OECD Americas (Figure 21).

Key demand trends in 2017

Total OECD final consumption in 2017 reached 3 711 Mtoe in 2017, with the increase of 39 Mtoe (+1.1%) the largest growth since 2013. This increase was proportionately more pronounced in Europe (+1.8%) and Asia-Oceania (+1.6%). Even though an increase occurred across all fuels, oil and gas accounted for almost 80% of the increase (Figure 22).

Figure 22: Total final consumption: 2017 change by source and region, OECD



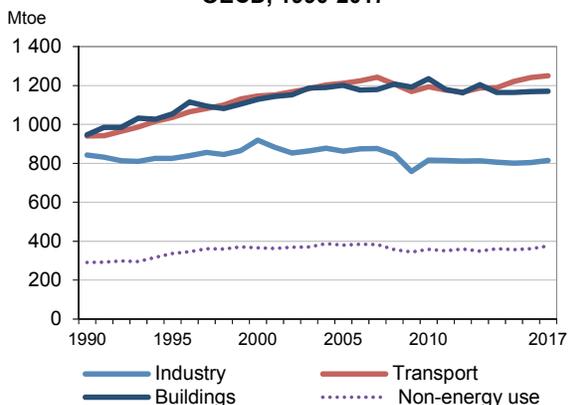
At a regional level, the growth in OECD Americas was dominated by natural gas in line with the respective increase in supply, whereas OECD Europe – which had the largest increase in absolute terms – experienced an increase across all energy sources.

At a more disaggregated level, none of the sectors decreased in 2017 with industry, transport and non-energy use of fuels contributing approximately the same shares (30%) to the growth. Conversely, the sectoral share of total final consumption (TFC) remained relatively stable compared to recent years (Figure 23).

On the one hand, the transport sector consumption reached a new record high (1 251 Mtoe), exceeding the previous one achieved pre-crisis in 2007, consolidating thus its position as the largest consuming sector

and confirming longer-term trends. On the other hand, the buildings sector (residential and services) remained almost flat (+0.1%) for a third consecutive year, with small changes (up and down) for different countries.

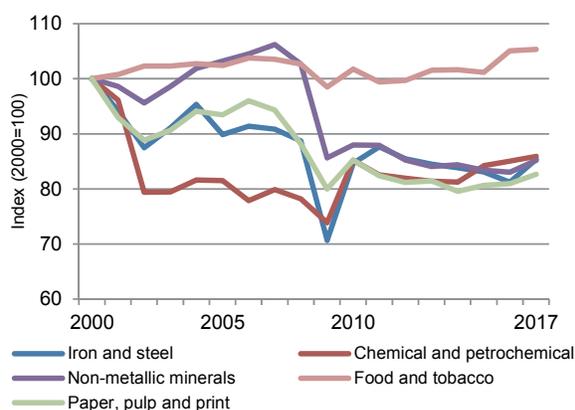
Figure 23: Final energy consumption by sector, OECD, 1990-2017



Industry consumption continued to fluctuate mildly around the same level since 2010, in the aftermath of the economic crisis.

The industrial sector has been the most stable sector in terms of final consumption, having decreased only marginally in absolute terms since 1990 (-3% 1990-2017) for OECD. This mild decrease, in conjunction with the growth in the other TFC sectors, indicates the changes taking place in the profile of the OECD economy, also reflected in the reduction of the final energy intensity (defined as TFC/GDP) by 34% for the same period.

Figure 24: Consumption of major industrial subsectors 2000-2017

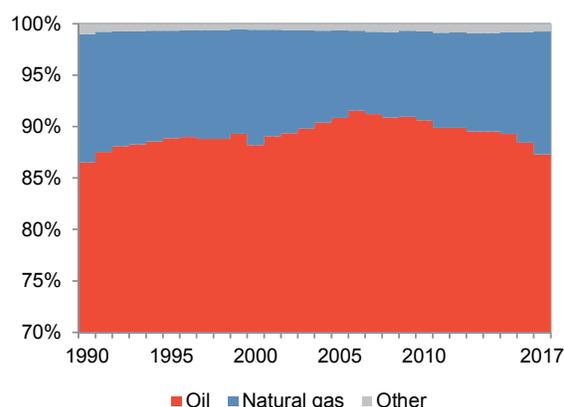


Due to structural differences in the national economies, the various industrial sub-sectors have moved differently for each country; however, at the OECD level, the

four out of the five largest sub-sectors experienced declining trends since 2000 with food and tobacco production being the only exception (Figure 24).

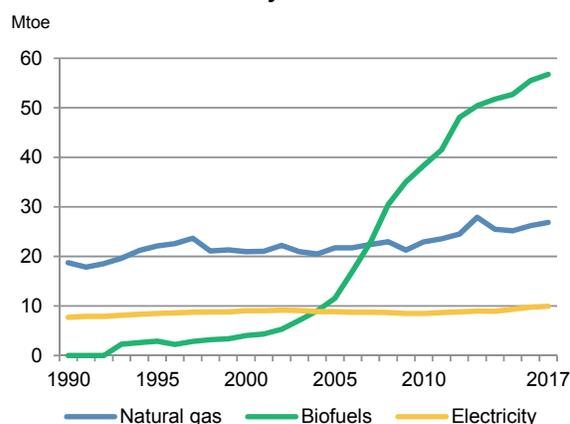
The consumption of fuels for non-energy use picked up pace in 2017 (+4%), showing the strongest increase since 2010. Natural gas non-energy use increased by 15% (driven primarily by OECD Americas), recording the highest growth since at least 2000. Nonetheless, natural gas's share just reached the levels of 1990 (Figure 25) after the decline experienced up to 2006, with the beginning of the shale revolution.

Figure 25: Fuel's share for non-energy use, 1990-2017



In transport, the largest consuming sector with over a third of the overall TFC, the consumption of oil remains dominant (93%), despite the rapid growth of biofuels after 2000. Other sources have been constantly increasing (Figure 26) faster in absolute terms than the overall consumption for transport. However this growth is not nearly fast enough to accommodate for the increased sectoral demand.

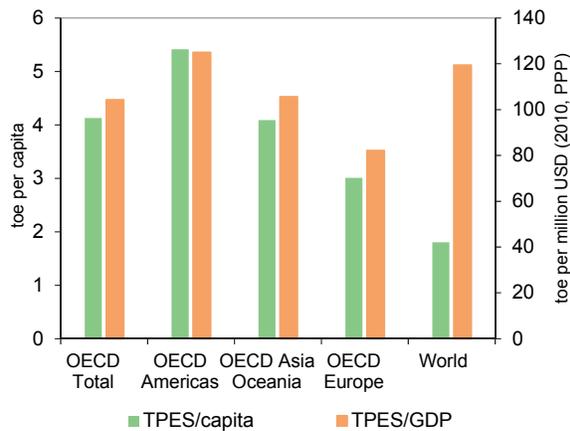
Figure 26: Consumption in transport by source, beyond oil



The OECD and IEA in the world

In terms of TPES per capita, the OECD remains the most energy-intensive region globally, by a factor of more than two (Figure 27). The 2018 figure remained stable compared to the previous year (4.1 toe per capita), after three consecutive years of modest reductions. Nevertheless, TPES per unit of GDP⁴ is much lower in the OECD relative to other regions. Moreover, TPES per GDP decreased by 2% in 2018 indicating an expansion of the economy faster than the energy supply's growth, as has historically been the case for the region at an aggregate level (-26% in TPES per GDP for 2017 compared to 2000).

Figure 27: OECD energy indicators by region 2018



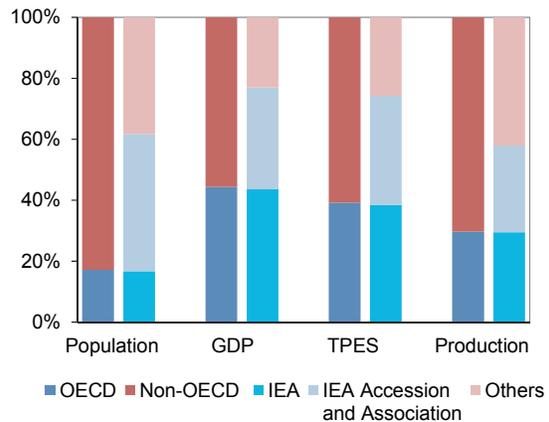
The historical intra-OECD regional differences are attributed to various structural factors, both economic (like the share of industry in the economic activity, cars per household) and geographical (like the densely

or sparsely populated areas, heating degree days). However, the decrease in energy intensity was a common feature in all the OECD regions for 2018.

In 2017, the OECD accounted for 17% of global population, 44% of GDP, 39% of TPES and 30% of energy production. Even though these shares have remained stable – or slightly declining – over the last few years, they have significantly changed since 1971, when the region⁵ accounted for 61% of the global energy supply, and 65% of GDP (Figure 28).

The shares are significantly larger when considering the full group of countries tightly connected with the IEA: IEA, Accession (Chile)⁶ and Association (Brazil, China, India, Indonesia, Morocco, Singapore, South Africa and Thailand) countries altogether accounted for around three quarters of the world GDP and TPES in 2017. More precisely, the IEA family group accounted for 62% of global population, 77% of GDP, 72% of TPES and 58% of energy production.

Figure 28: OECD and IEA in the world, 2017



4. GDP measured in PPP with 2010 as base year.

5. The regional composition is constant and based on membership at the time of preparation of the publication (July 2019).

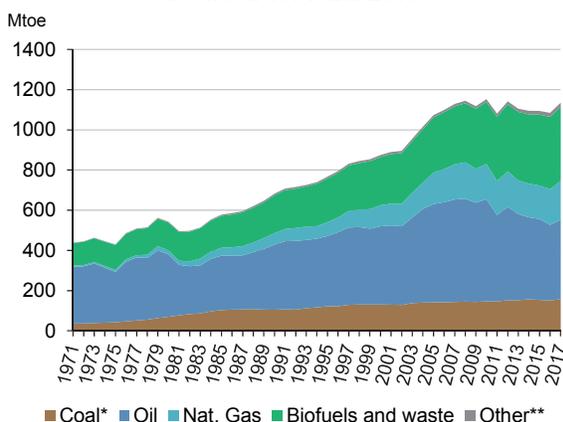
6. At the time of the preparation of the publication Lithuania was not yet formally an IEA Accession country and therefore has not been included in the relevant aggregate.

Africa

In 2017, Africa produced 8.1% of the world's energy, a similar share as in 1971 (7.8%), although African energy production almost tripled during the same period (Figure 29). African energy production is dominated by oil (35%), and biofuels and waste (32%), followed by natural gas (17%) and coal (14%). In 1971 oil was even more predominant in production (65%), far above biofuel and waste (26%); natural gas was almost negligible (0.9%).

Africa's share of global TPES increased from 3.4% in 1971 to 5.8% in 2017; and despite many African countries being dependent on imports of fossil fuels, as a region it is energy self-sufficient and a net exporter of coal, natural gas and crude oil.

Figure 29. Energy production in Africa between 1971 and 2017



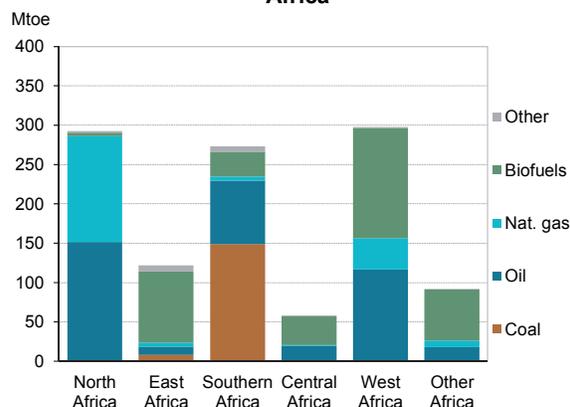
* In this graph peat and oil shale are aggregated with coal.

** Other includes nuclear, hydro, solar, wind, geothermal and heat from other sources.

Fossil fuels production is unevenly distributed across Africa (Figure 30). With 152 Mtoe, North Africa remained the main producer of crude oil in 2017, due to Algeria, Libya and Egypt production, although at the country level Nigeria remains the first crude oil producer in Africa, representing 24% (95 Mtoe) of the continent's production. North Africa produces mainly crude oil and natural gas: in 2017, Algeria accounted for 42% of the natural gas and 18% of the crude oil in Africa, Egypt for 22% of natural gas and 8% of crude oil and Libya for 12% of crude oil and 3.8% of natural gas. Southern Africa is characterized by a high share of coal and of crude oil; South Africa, the 4th largest coal net exporter in the world, produced 92.5% of African coal in 2017 whereas Angola was the second biggest

producer of crude oil in Africa, with 20% of the region's production. Energy production in East and Central Africa remains dominated by solid biofuels.

Figure 30. Energy production by sub-region in 2017



* In this graph peat and oil shale are aggregated with coal.

North Africa includes Algeria, Egypt, Libya, Morocco and Tunisia;

East Africa includes Eritrea, Ethiopia, Kenya, Mauritius, Mozambique, South Sudan, Sudan and the United Republic of Tanzania;

Southern Africa includes Angola, Botswana, Namibia, South Africa, Zambia and Zimbabwe;

Central Africa includes Cameroon, Congo and Democratic Republic of Congo;

West Africa includes Benin, Côte d'Ivoire, Gabon, Ghana, Niger, Nigeria, Senegal and Togo

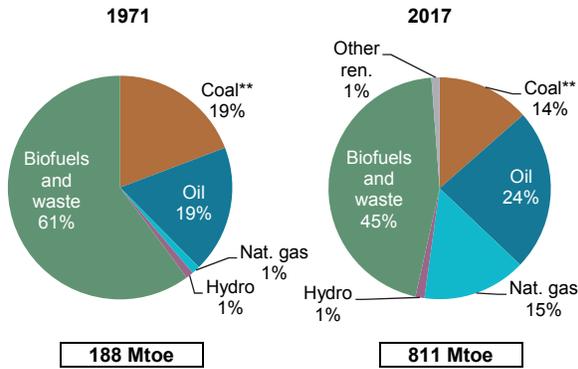
Other Africa please refer to the explanatory note on geographical coverage.

In 2017, Africa's crude oil production started to grow again (+5.3%) after having declined between 2013 and 2016. This growth was led by the rise of Libyan production (+122%), reaching a level of production close to 2013 (46.4 Mtoe in 2017), and Ghana expanding exploitation of its oil and gas fields (+80%, +3.7 Mtoe). The production of oil also increased in Congo, the Democratic Republic of the Congo and Côte d'Ivoire (15.5%, 20.3% and 23.2%, respectively) but decreased in Algeria (-2.4%) and Angola (-7.7%). Africa represented 8.8% of world crude oil output and it exported 78% of this production in 2017.

The production and consumption of biofuels (mainly fuelwood) is significantly higher across Africa (45% of total TPES in 2017) than the world average (9.5% of total TPES). The presence of large forests, agro-industry, agriculture, a large rural population, and a low GDP per capita have resulted in a large use of solid biofuels for cooking. Because of the extensive use of wood and charcoal with its low efficiency, energy intensity⁷ is higher than the world average.

7. Measured by the ratio TPES/GDP.

Figure 31: Total primary energy supply* by fuel Africa



* Excluding electricity trade.
 ** In this graph peat and oil shale are aggregated with coal.

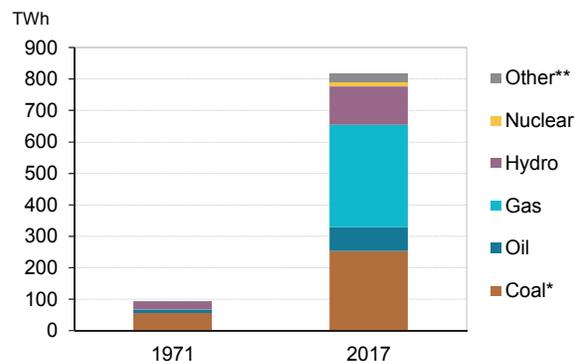
However, the share of biofuels and waste in TPES, dominated by solid biofuels, has decreased significantly between 1971 and 2017 (Figure 31), due to increased electrification, and particularly the recent development of power generation from natural gas. Natural gas share in TPES increased steeply from 1% in 1971 to 15% in 2017. Coal continued to represent an important share of African TPES even if it has declined over the period (14% in 2017, a 5 percentage points decline since 1971). Its share is largely due to South Africa, where coal represented in 2017 92% of the country’s primary production, 74% of TPES, 90% of electricity generation and 27% of total final consumption.

In 2017, power generation in Africa was almost nine times the level in 1971 (Figure 32), whilst also seeing a significant change in the fuel mix. Power generation from natural gas was almost nil in 1971 but in 2017 provided 325 TWh of electricity, a 40% share of electricity generation in Africa (compared to 27% in OECD, 40% also in non-OECD Europe and Eurasia, and 72% in the Middle East). Its share in the power

mix reached even higher levels in gas-producing countries such as Algeria (98.7%), Nigeria (82.7%), and neighbouring importing countries like Tunisia (95.8%). In 1971, coal was the first fuel used for power generation in Africa (62%); in 2017 it ranked second after natural gas and accounted for 31% of power generation, providing 254 TWh. Hydro was the second provider of electricity in Africa in 1971 (23 TWh, 26% of the power produced in the continent) and ranked third in 2017 with 123 TWh.

Electricity production reflects the disparity in fossil fuel resources between sub-regions of Africa. In 2017, North African countries plus South Africa represented only 20% of the population but generated 74% of the electricity in Africa. Even if access rates are increasing, this remains a concern for most Sub-Saharan African countries, with national electrification rates in 2016 averaging 41.7%, compared to 50.6% for the whole continent, but only 22.3% in rural Sub-Saharan areas, and much less in some countries (1.5% in Burkina Faso, 0.7% in Chad, 1.0% in Central African Republic, Djibouti and 0.4% in the Democratic Republic of Congo, Niger or 0.2% in South Sudan)⁸.

Figure 32. Electricity generation by source, Africa



* In this graph peat and oil shale are aggregated with coal.
 ** Other includes non-renewable waste and non-renewable heat.

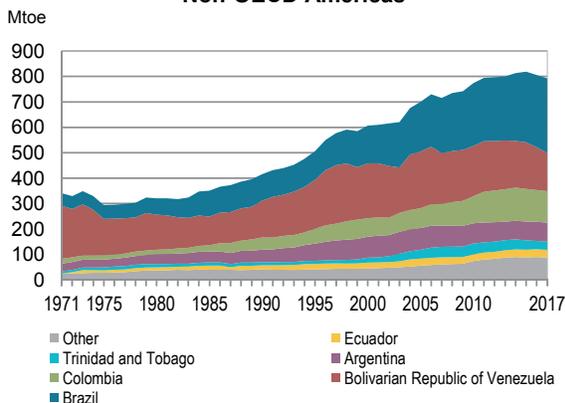
8. Electrification rate extracted from the World Energy Outlook 2018 electricity database: www.worldenergyoutlook.org/resources/

Non-OECD Americas

In 2017, non-OECD Americas' main energy producers were, in descending order, Brazil, the Bolivarian Republic of Venezuela, Colombia, Argentina, Trinidad and Tobago and Ecuador (Figure 33). Together they produced 89% of the 792 Mtoe of energy produced by the whole region. Brazil alone was responsible for 37% of the region's production in 2017. Brazil's crude oil production, 48% of the region's 2017 production, has been increasing for four years in a row. In 2017 it reached 140 Mtoe, an almost 30% growth compared to 2013. Natural gas accounted for only 7.9% of Brazil's total energy production in 2017 but increased by 13.1% compared to 2016.

Non-OECD Americas produced 13 Mtoe less in 2017 compared to 2016. This -1.6% decrease was mainly due to a production drop in Venezuela (-11.5%), Colombia (-0.7%), Argentina (-2.0%), Trinidad and Tobago (-0.2%) and Ecuador (-2.0%). In the region's top producers the only increase of energy production was in Brazil (+3.1%), and did not offset this decrease.

**Figure 33. Energy production by country
Non-OECD Americas**

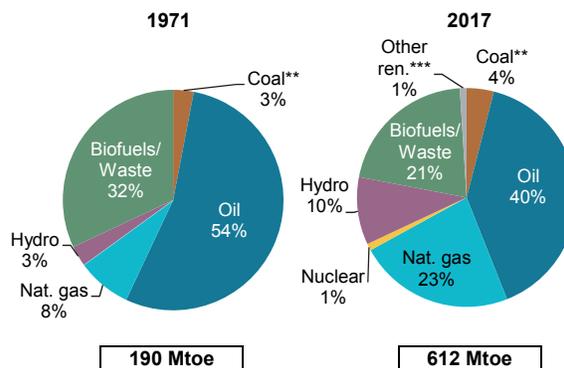


In Colombia, which accounted for 96% of the region's coal, production remained almost the same compared to 2016 with 59 Mtoe. In Venezuela, crude oil production declined for the sixth year in a row, reaching 123 Mtoe in 2017 (-12%): Brazil became the biggest crude oil producer of non-OECD Americas with 4.5% increase in 2017. The region's natural gas production was fairly stable in 2017 (-0.1%), as reflected by the two biggest producers, Argentina (-0.3%) and Trinidad and Tobago (-0.4%). The production increase in Brazil (+13%) was offset by

lower production in some of the region main providers, Venezuela (-1.9%) and Peru (-11%).

Overall the energy mix in non-OECD Americas in 2017 was similar to 2016: oil provided the biggest share of TPES in the region (40% - Figure 34), followed by natural gas (23%) and biofuels and waste (21%).

**Figure 34. Total primary energy supply* by fuel,
Non-OECD Americas**



* Excluding electricity trade.

** In this graph peat and oil shale are aggregated with coal.

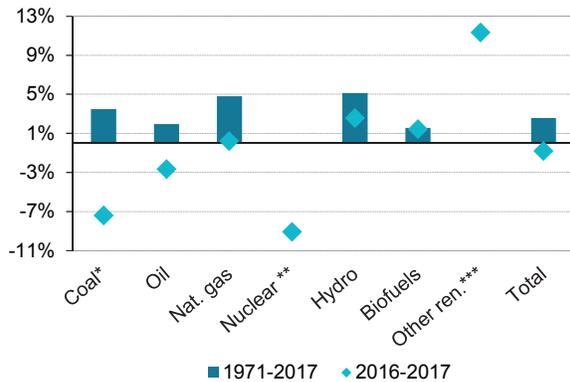
*** Includes geothermal, solar thermal, solar photovoltaic and wind.

Thirty-one per cent of non-OECD Americas TPES came from renewables, whereas this share was only 14% in the world. With a 21% share of the TPES (twice more than globally), liquid biofuels (and in particular transport biofuels in Brazil) in addition to traditional solid biofuels, are significant in non-OECD Americas. Following a steady 4.4% increase in the last four years, biofuels production increased by 1.2% in 2017. Even though hydro production decreased in the two biggest hydro producers, Brazil (-2.6%) and Paraguay (-6.4%), overall hydro production increased by 2.6% in 2017 in the wake of increased production in Colombia (+25.1%) after 4 years of droughts and increasing capacity, and Argentina (6.8%) after a dry season. Hydro accounted for 57% of total non-OECD Americas power generation, a much higher share than globally (16%).

In 2017, the energy production of other renewables (solar thermal, solar photovoltaic, wind, geothermal), increased by 11.3% compared to 2016 (Figure 35), led by a +24% production increase in Brazil, the biggest producer of other renewables in the region.

Coal accounted only for 4% of non-OECD America's TPES for 2017 and coal primary energy supply declined by 7.4% due to a 24% increase of Colombia coal exports compared to 2016.

Figure 35. Annual change in TPES by fuel, Non-OECD Americas



* In this graph peat and oil shale are aggregated with coal.
 ** No nuclear production in 1971.
 *** Includes geothermal, solar thermal, solar photovoltaic and wind. No production in 1971.

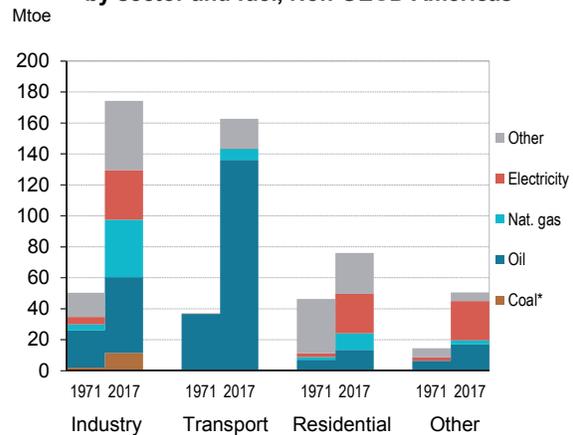
There are only two countries in non-OECD Americas with nuclear power, Brazil and Argentina, and a sharp decrease in Argentina (-25%), due to not working at full capacity throughout the year, resulted with a 9% decline overall in the region.

In 2017, industry remained the biggest energy-consuming sector (38%), followed by transport (35%), far above residential (16%). Industry increased from 50 Mtoe in 1971 to 174 Mtoe in 2017. However, it is in the transport sector that the increase of energy final consumption was the biggest: it multiplied by more

than four times since 1971 (Figure 36). Residential nearly doubled over the period, and ranked third in 2017.

In 1971, oil accounted for half of total final consumption (TFC) and it peaked at 55% in 1979 before the second oil crisis. However the increasing role of electricity and gas in the residential and the industry sectors lead to a slowly diminishing share of oil in TFC that reached 46% in 2017. The share of electricity has almost tripled during that period, reaching 18% in 2017. Natural gas consumption increased from less than 4% to 12%, mainly driven by industry (from 7% to 22%) and residential (from 4% to 14%) use.

Figure 36. Total final consumption by sector and fuel, Non-OECD Americas

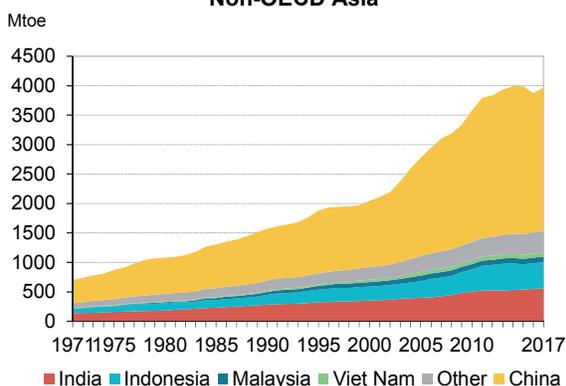


* In this graph peat and oil shale are aggregated with coal.

Non-OECD Asia

Since the early 1990s non-OECD Asia has been the second largest energy-producing region in the world behind the OECD, accounting for 28% of global production in 2017 with a production of 3 971 Mtoe. China⁹ alone provided 61.7% of energy production in the region in 2017 (Figure 37) compared to 60.9% in 2016. India and Indonesia together accounted for a quarter of the region's production (14.0% and 11.3% respectively).

**Figure 37. Energy production by country
Non-OECD Asia**

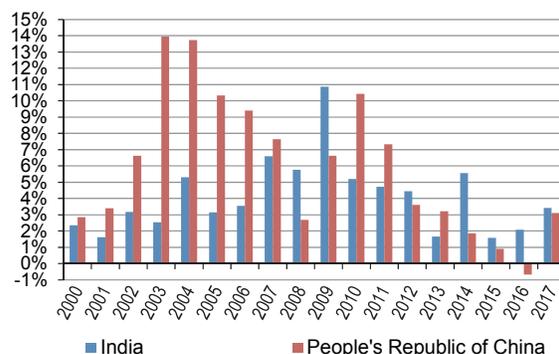


In 2017, non-OECD Asia's total primary energy supply (TPES) continued to increase at a higher rate compared to previous years (+3.3% in 2017, after +0.7% in 2016 and +1.2% in 2015). It thus seems decoupled from the economic growth, as GDP increased by 6.3% in non-OECD Asia in 2017. This is particularly true in China, where GDP increased by 6.9% in 2017, while TPES increased by 3.1%. In India, GDP increased by 6.7% in 2017 whilst TPES by 3.4%. TPES in India has been continuously growing in the last decade, whereby growth slowed down in 2015 and 2016 to take up again in 2017. India TPES has been growing at a faster rate than China's since 2014 (Figure 38).

In 2017, non-OECD Asia accounted for 35.5% of global TPES. However, since its production does not cover its demand, the region is a net importer. China and India are both energy dependent, with self-sufficiencies of 80% and 63%, respectively, in 2017. While China was once self-sufficient with a peak at 108% in 1985, India reached a maximum self-sufficiency rate of 96% in 1984. As for Indonesia, though it covered 184% of

9. Throughout the "Non-OECD Asia" chapter, China stands for People's Republic of China.

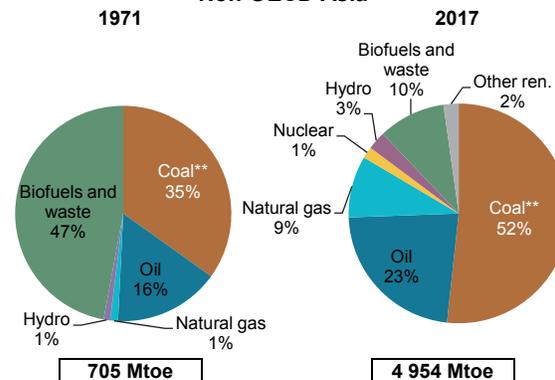
**Figure 38. TPES annual change
India and China**



its energy needs in 2017, its self-sufficiency has been decreasing since 2013, when the country became a net importer of crude oil.

Over the decades the fuel mix of the region has changed drastically. In 2017, the share of biofuels in non-OECD Asia TPES decreased to 10% from 47% in 1971; natural gas has reached 9% of TPES, from negligible in 1971. Coal has been by far the main energy source in non-OECD Asia since 2012, supplying more than half of its energy demand in 2017 (Figure 39), compared to 27% globally. This is also the case in the main energy-consuming countries (Figure 40).

**Figure 39. Total primary energy supply* by fuel
Non-OECD Asia**

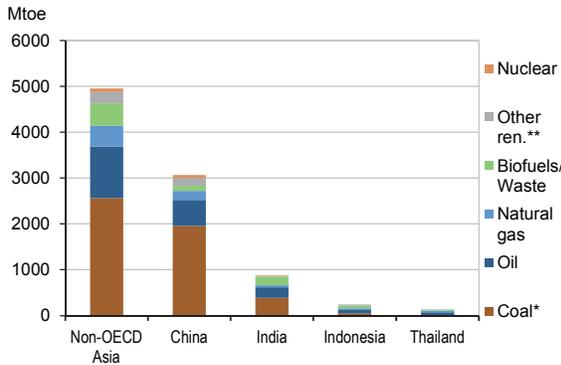


* Excluding electricity trade.

** In this graph peat and oil shale are aggregated with coal.

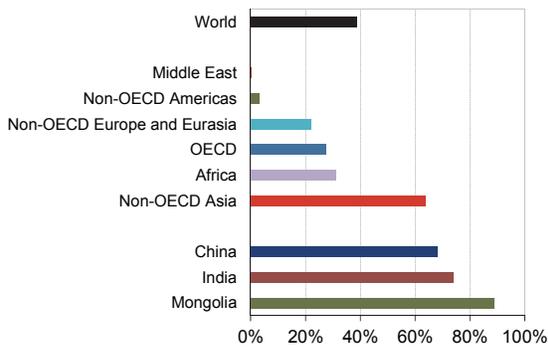
Coal's weight is partly explained by its use in power generation: in 2017, it represented 63.6% of the regional electricity mix, versus 38.5% globally (Figure 41). Coal provided 74% of electricity in India, 68% in China and 58% in Indonesia. The country mostly relying on coal for power in the region is Mongolia (89%). In China, the power mix is gradually shifting from coal to other fuels (natural gas, nuclear, renewables).

**Figure 40. TPES by fuel and by country in 2017
Non-OECD Asia**



* In this graph peat and oil shale are aggregated with coal.
** Includes geothermal, hydro, solar thermal, solar photovoltaic and wind.

Figure 41. Share of coal in electricity generation in 2017

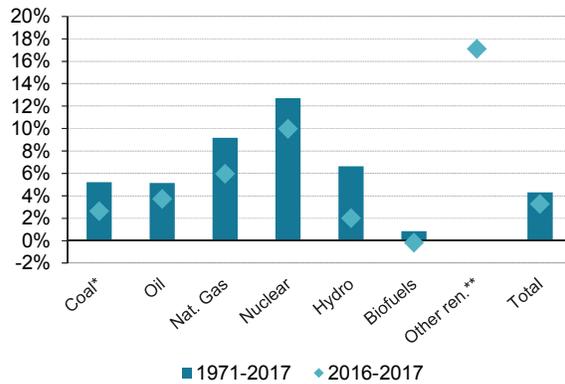


In 2017, electricity generation in non-OECD Asia increased by 5.9%, driven by China (+6.7%, around 6 600 TWh produced) and India (+5.1%, more than 1 500 TWh). Power production has grown in the region at an average annual rate of 8% since 1971.

The use of coal, oil, gas and hydro as measured by TPES increased in 2017 whilst that of biofuels decreased. However, the most significant growth came from other renewables (geothermal, solar photovoltaic, solar thermal and wind), followed by nuclear (Figure 42).

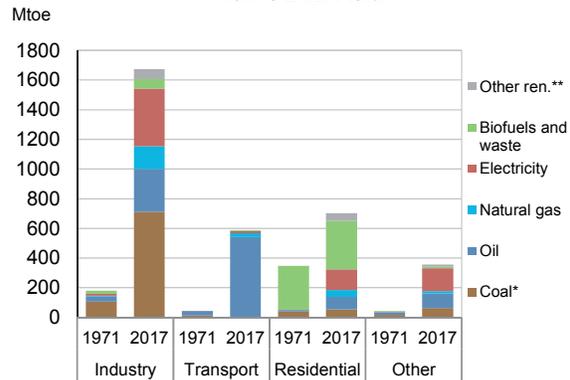
Total final consumption in non-OECD Asia has increased by more than five times over four decades and the mix has changed considerably. The share of traditional biofuels (biomass, waste) has fallen to a third of its 1971 level (53% of total energy consumption in 1971 compared to 12% in 2017). The share of oil in total final consumption has doubled (from 14.8% to 30.5%), leading oil to be the biggest fuel consumed in the region, followed by coal (25% of the total final

**Figure 42. Annual growth in TPES by fuel
Non-OECD Asia**



* In this graph peat and oil shale are aggregated with coal.
** Includes geothermal, solar thermal, solar photovoltaic and wind.

**Figure 43. Total final consumption by sector and fuel
Non-OECD Asia**



* In this graph peat and oil shale are aggregated with coal.
** Includes direct use of geothermal, solar thermal and heat.

consumption). The share of electricity rose from 3.2% to 21%. With a nine-fold increase, industry is by far the biggest energy-consuming sector in non-OECD Asia, representing 50% of the region's total final consumption in 2017 (Figure 43).

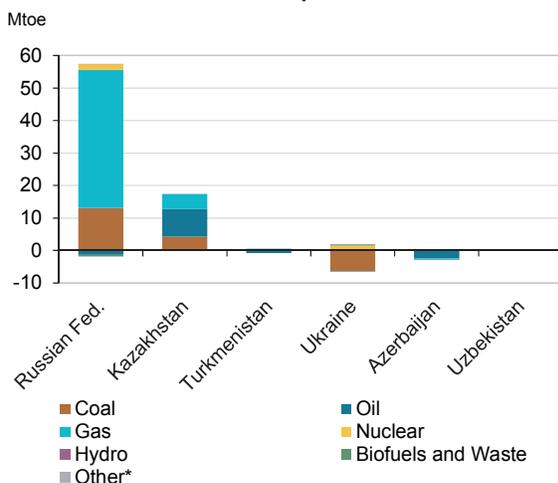
Though coal is still the main fuel consumed in industry (43% in 2017), its share in the sector is decreasing in favour of electricity (23%).

The residential sector is the second largest consumer behind industry with a share of 21% of the final consumption, directly followed by the transport sector (18%). Though traditional biomass is still the main fuel consumed in the residential sector, electricity, oil and natural gas have significantly increased. Energy consumption has multiplied 14 times in the transport sector, relying mainly on oil.

Non-OECD Europe and Eurasia

In 2017, total energy production in non-OECD Europe and Eurasia increased by 3.6% (+66 Mtoe), a higher growth rate than in OECD. This growth was largely driven by a 4.0% increase of energy production in the Russian Federation, which represented 74% of the total regional production. Production of natural gas and coal increased in the Russian Federation between 2016 and 2017 (by 43 Mtoe for the former, and by 13 Mtoe for the latter). Inversely, oil production fell by 1 Mtoe in 2017, its first annual decline since 1998. Energy production in the region was also boosted by strong growth of fossil fuels in Kazakhstan (Figure 44).

Figure 44. Top producers Annual change in production in 2017 Non-OECD Europe and Eurasia



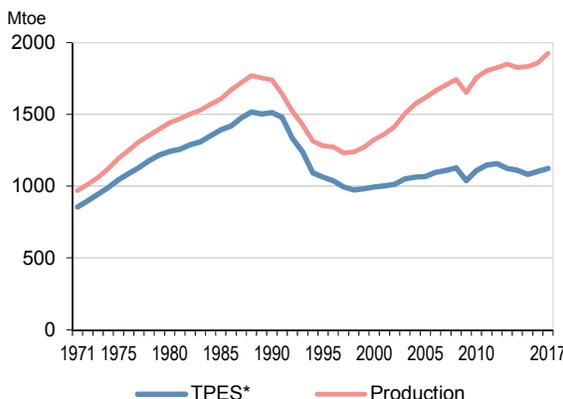
*Other includes geothermal, solar, wind and heat

Preliminary data for 2018 shows that the Russian Federation was the world's second largest producer and the first net exporter of natural gas (respectively 715 bcm and 236 bcm), the third largest producer of crude oil (554 Mt), and the sixth largest producer and third net exporter of coal (respectively 420 Mt and 182 Mt). Turkmenistan remained the sixth largest net exporter of natural gas and Kazakhstan the eighth largest net exporter of coal.

Energy production is very unevenly distributed across non-OECD Europe and Eurasia. Although the region as a whole is energy self-sufficient - its ratio hit a new high of 171% in 2017 (Figure 45), - it includes some of the most energy import-dependent countries in the

world. For instance the self-sufficiency ratio in 2017 was 3% in Malta, 6% in Cyprus and 15% in Belarus.

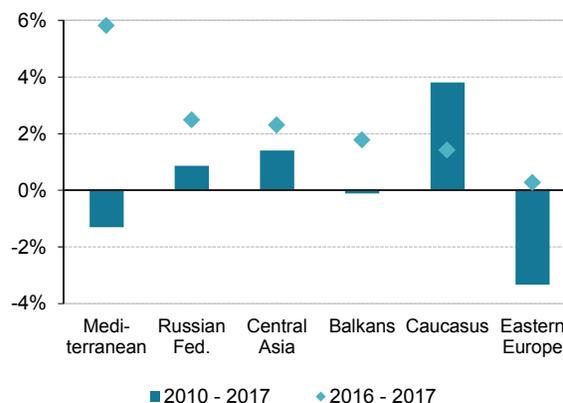
Figure 45. Energy production and supply 1971-2017 Non-OECD Europe and Eurasia



*excluding electricity trade.

In 2017, the Total Primary Energy Supply (TPES) in non-OECD Europe and Eurasia increased by 2.1% (23 Mtoe). TPES increased in all sub-regions between 2016 and 2017, inverting the 2010-2016 trends in Eastern Europe, Balkans and Mediterranean. At sub-regional level, the highest growth (5.8%) was observed in the Mediterranean (Figure 46). However, the countries in this sub-region represented less than 1% of non-OECD Europe and Eurasia energy demand.

Figure 46. Annual average change in total primary energy supply by sub-region Non-OECD Europe and Eurasia



Balkans is Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo, Montenegro, Republic of North Macedonia, Romania and Serbia;
Caucasus is Armenia, Azerbaijan and Georgia;
Central Asia is Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan;
Mediterranean is Cyprus, Gibraltar and Malta;
Eastern Europe is Belarus, Moldova and Ukraine.

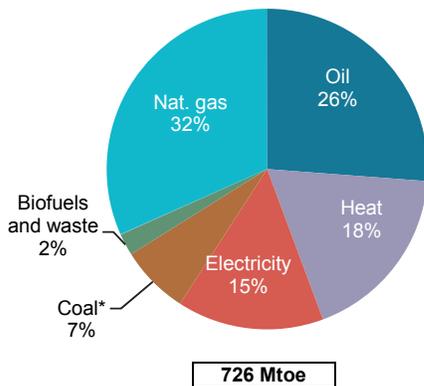
Note: Estonia, Latvia, Lithuania and Slovenia are OECD members.

The evolution of TPES is also uneven across the region. In the period 2010-2017, its annual average growth was only 0.2%. In detail, Eastern Europe reduced its TPES by 21.1% compared to 2010 levels, while the Caucasus region increased its TPES by 30%.

At the national level, TPES increased by 2.5% (18 Mtoe) in the Russian Federation between 2016 and 2017, and decreased in Ukraine (-2.4%), the second largest energy consumer in the region. Both trends are linked to changes in total final consumption (5.0% and -3.6% growth respectively). TPES significantly increased in Kazakhstan (+4.1%), the third largest consumer in the region.

In 2017, natural gas was the most commonly used fuel in the regional total final consumption (32%), followed by oil (26%), heat (18%) and electricity (15% - Figure 47). 50 Mtoe of coal were also consumed by final sectors in the region in 2017 (7% of total). Total final consumption grew by 3.4% in 2017, reaching its highest level since 1995.

Figure 47. Total final consumption by fuel, Non-OECD Europe and Eurasia, 2017



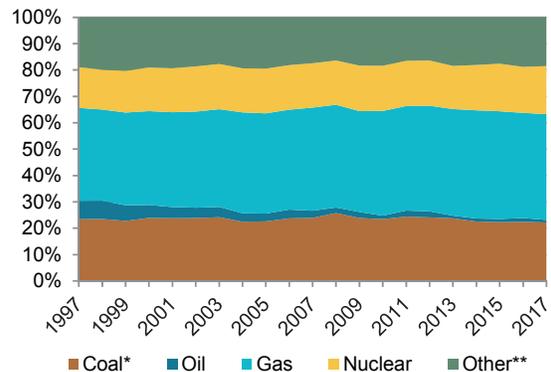
* In this graph peat and oil shale are aggregated with coal

Roughly half of the total final consumption growth between 2016 and 2017 was explained by a 6.4% growth in residential consumption. Road transport consumption in non-OECD Europe and Eurasia also reached the highest level since 1991 (93 Mtoe).

The regional electricity mix in 2017 was dominated by natural gas (40%), followed by coal (22%), and nuclear (18%). Non-OECD Europe and Eurasia was the second largest nuclear-producing region in the world, with the Russian Federation, Ukraine, Bulgaria, Romania, and Armenia producing a total of 318 TWh (12.1% of world). Renewables, largely hydropower, accounted for 19% of the regional electricity mix in 2017. Solar and wind electricity generation, though increasing (+12.3% in 2017 from 2016), accounted only for 1% of regional electricity output.

Total power generation grew by 27% in the period 1997-2017. However, the power generation mix of the region was very stable over the same period, except for the decline of oil, which is also true worldwide (Figure 48).

Figure 48. Electricity generation by source, Non-OECD Europe and Eurasia, 1997-2017



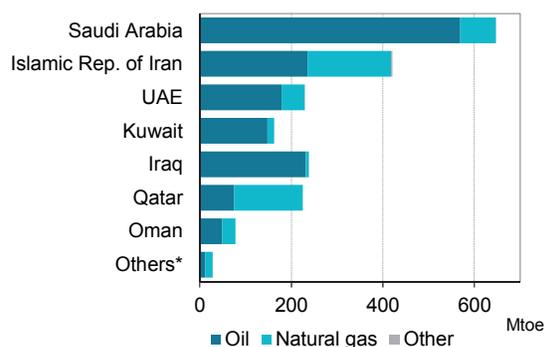
* Peat and oil shale are aggregated with coal

** Other includes hydro, biofuels and waste, geothermal, solar, wind and heat

Middle East

With energy production more than 2.8 times as large as its demand, and reaching 2,032 Mtoe in 2017 (-0.6% over 2016), the Middle East has the highest energy self-sufficiency ratio in the world. The region produced 14.5% of global energy in 2017, and more specifically 33.5% of global oil, and 16.6% of the world's gas. The Middle East's global share of natural gas production has more than doubled since 1997, when it was 7% of world natural gas production.

**Figure 49. Energy production in 2017
Middle East**



* Includes coal, nuclear, hydro, other renewables, biofuels and waste

Saudi Arabia was still by far the largest oil producer in the region with 38% and 569 Mtoe, followed by Iran and Iraq, with 16% and 15% respectively (Figure 49).

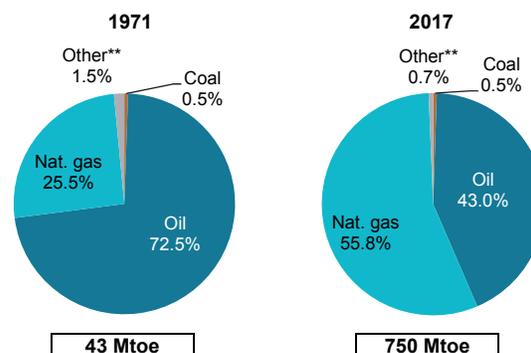
In 2017, the major growth in oil production was seen in Iran (+8.2%). At 235 Mtoe, Iran's production reached its highest level since 2007. Other notable growth in oil production was seen in Iraq (+1.9%), which reached a record in its production at 231 Mtoe. As for Yemen, its oil production increased by 6.2% in 2017 after an almost continuous decrease since 2003 from 22 Mtoe of crude oil produced that year to slightly more than 1 Mtoe in 2017. Oil production declined however in OPEC members such as Kuwait (-7.4%), Saudi Arabia (-4.6%), United Arab Emirates (-4.3%) and Qatar (-3.4%), but also in Bahrain (-2.8%) and Oman (-3.5%) leading to an overall decrease of 2.0% of oil production in the region in 2017.

Natural gas production almost continuously increased in the Middle East since the 1970s, reaching 526 Mtoe in 2017 – 34 times more than in 1971, and four times more than in 1997. With 35% of the region's natural gas production (182 Mtoe), Iran maintained its position as the Middle East's top producer in 2017,

followed by Qatar at 28%, with 150 Mtoe. Iran's natural gas production increased by 7.9% in 2017, a slightly slower growth compared to the 8.6% increase in 2016. Meanwhile natural gas production in Qatar was fairly stable (-0.4% in 2017 compared to +1.3% in 2016). The third biggest natural gas producer in the Middle East is Saudi Arabia, where production has continuously increased and reached 78 Mtoe in 2017.

TPES in the Middle East increased by 1.9% in 2017 compared to 2016 and reached 750 Mtoe. Though TPES has grown faster in several regions in 2017, Middle East is still the fastest growing region in terms of TPES over the period from 1971 to 2017 (+6.4% per year). In 2017, this supply is almost exclusively based on oil and natural gas (Figure 50). Natural gas has partially displaced oil, more than doubling its share between 1971 and 2017.

**Figure 50. Total primary energy supply* by fuel
Middle East**



* Excluding electricity trade.

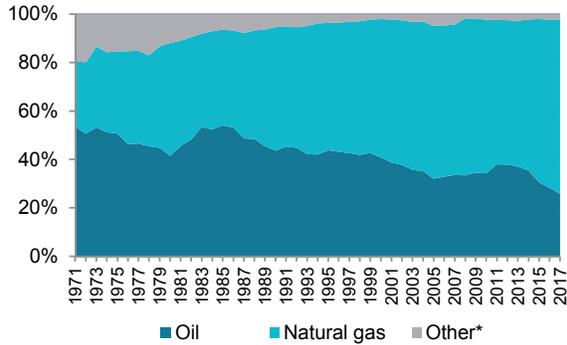
** Includes nuclear, hydro, other renewables, biofuels and waste

Key factors driving the rapid development of natural gas in the Middle East are power generation and the petrochemical sector. This is illustrated by the share of oil in electricity production continuing to shrink, starting with 54% in 1971 and reaching 26% in 2017 (Figure 51).

In contrast, the share of natural gas in electricity production continually increased, from 27% to 72% in the same period (compared with 23% at global level). In 2017, natural gas continued to provide all the electricity generated in Bahrain and Qatar, and more than 95% in the United Arab Emirates and Oman. In Iran and Jordan, natural gas's share in electricity generation reached over 80% in 2017. In Jordan, this change has come swiftly, with natural gas generating just 48% of the electricity in 2015 and 84% the following year, due in large part to the government promoting fuel switching. Except in Lebanon, where

electricity is still mainly generated from oil and a small share of hydro, natural gas represents at least a third of power generation in each country of the region.

Figure 51. Electricity generation by source Middle East

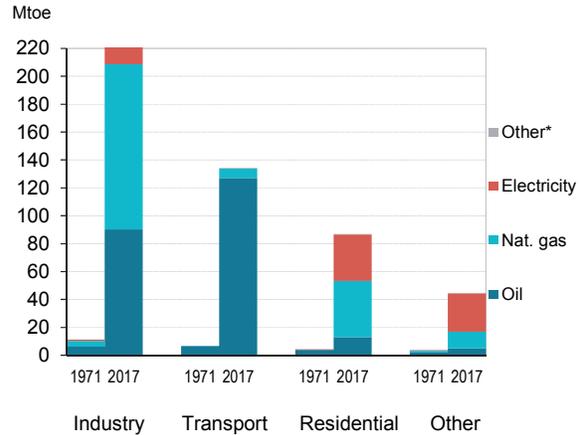


* Includes coal, nuclear, hydro, other renewables, biofuels and waste.

Over the last four decades, total final consumption expanded in all sectors, particularly industry and transport, which increased twenty fold. In 2017 oil accounted for around 95%, 25% and 15% of final consumption in transport, industry and residential,

respectively (Figure 52). Oil is responsible for almost 48% of total energy consumption in the Middle East. Also in 2017, natural gas met 63% and 46% of final consumption in industry and residential, respectively. Electricity tripled its share in final energy consumption from 5.6% in 1971 to 15.4% in 2017.

Figure 52. Total final consumption by sector and fuel Middle East



* Includes coal, other renewables, biofuels and waste
In this graph, non-energy use was classified with industry.