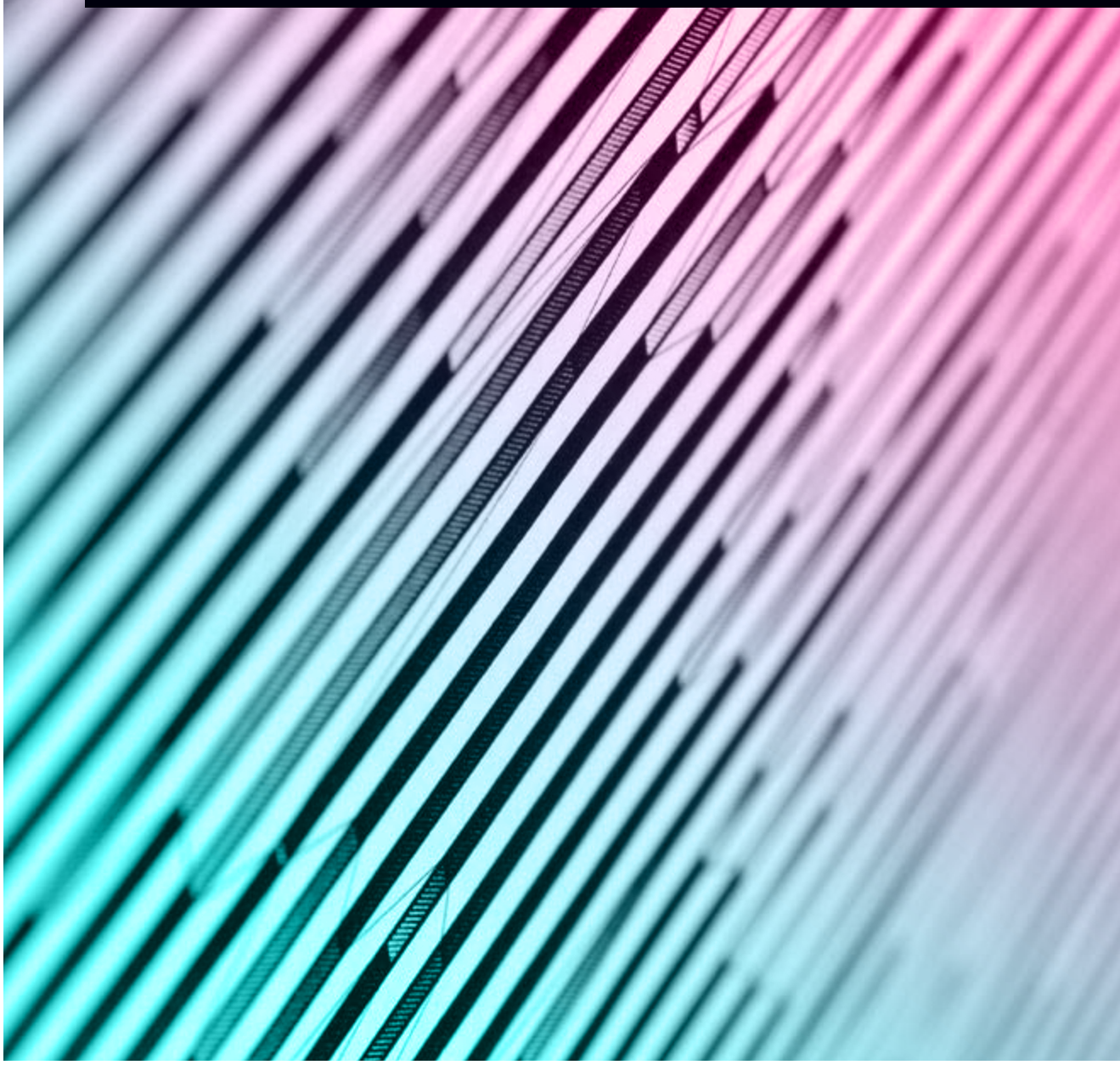
statistics

Energy efficiency indicators

HIGHLIGHTS



International Energy Agency
Secure Sustainable Together

2018

Energy efficiency indicators

HIGHLIGHTS

2018

INTERNATIONAL ENERGY AGENCY

The IEA examines the full spectrum of energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management and much more. Through its work, the IEA advocates policies that will enhance the reliability, affordability and sustainability of energy in its 30 member countries, 7 association countries and beyond.

The four main areas of IEA focus are:

- **Energy Security**: Promoting diversity, efficiency, flexibility and reliability for all fuels and energy sources;
- **Economic Development**: Supporting free markets to foster economic growth and eliminate energy poverty;
- **Environmental Awareness**: Analysing policy options to offset the impact of energy production and use on the environment, especially for tackling climate change and air pollution; and
- **Engagement Worldwide**: Working closely with association and partner countries, especially major emerging economies, to find solutions to shared energy and environmental concerns.

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The European Commission also participates in the work of the IEA.

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What's new?

New IEA Member: Mexico

Mexico became the International Energy Agency's 30th member country on 17 February 2018. Accordingly, Mexico is included for the first time in the 2018 edition of this publication, in the section dedicated to IEA member countries.

New country included: Turkey

Thanks to significant improvements in terms of data coverage and on developing energy efficiency indicators, data for Turkey are included for the first time in this publication.

New section: beyond IEA member countries

In this edition, a new section was added, dedicated to non-member countries which have partnered with the IEA on the development of energy efficiency data and indicators. Among these, there is an IEA association country (Morocco); and four countries from Eastern Europe, Caucasus and Central Asia region (Armenia, Belarus, Republic of Moldova and Ukraine). The collection of energy efficiency data for the four latter countries has been made possible with the financial assistance of the European Union, as part of the EU4Energy project (https://www.eu4energy.iea.org/).

It is our wish that more will follow in future editions.

New regional aggregate: IEA

In this edition, the data presented in previous editions for each individual country are now also shown for a new regional aggregate – IEA – including a cross sectoral overview and the three sectoral pages.

Energy efficiency indicators at the IEA

The IEA energy efficiency indicators statistical report is based on national annual data collected by the IEA since the 2009 Ministerial agreement.

This publication presents a selection of energy efficiency indicators data for IEA Member countries and beyond, where data are available, mainly in graphical format; and an analysis of overall IEA trends. Data are based on submissions from national administrations to the IEA. The IEA Secretariat is working with national administrations to improve data quality over time. Still, as collecting end-use energy and activity data is particularly challenging, data availability varies across IEA countries, and coverage may be incomplete for a given sector in a given country.

This publication and associated data are available at https:/www.iea.org/statistics/efficiency/.

Inquiries should be addressed to energyindicators@iea.org.

Please note that all IEA data is subject to the following Terms and Conditions found on the IEA's website: www.iea.org/t&c/.

Energy efficiency indicators data for IEA member countries[1,2] and countries beyond IEA were collected by the Energy Data Centre (EDC), headed by Duncan Millard. Within the IEA, data were prepared by Mafalda Silva, Jungyu Park, and Víctor Garcia, who also produced this report. Roberta Quadrelli had overall responsibility for this report. Desktop publishing support was provided by Sharon Burghgraeve.

The report also benefited from the collaboration with Claire Morel under the EU4Energy program to develop the new section beyond IEA. This report benefited from discussions and feedback from several IEA colleagues including Joe Ritchie, Sacha Scheffer, Kathleen Gaffney, Stéphanie Bouckaert, Pierpaolo Cazzola, Till Bunsen, John Dulac and Araceli Fernandez Pales.

The IEA would like to thank and acknowledge the dedication and professionalism of the statisticians working on energy efficiency data in all the respective countries.

Data for some European countries have been collected through cooperation with the Odyssee project: www.indicators.odyssee-mure.eu/, as detailed in the *Country notes*.

The *Energy efficiency indicators – Highlights* publication is complemented by the IEA Energy Efficiency Indicators database, which includes end use energy consumption by energy product, as well as end use efficiency and carbon indicators for all the years between 2000 and 2016. Selected information is also available for free download at https://www.iea.org/statistics/efficiency/.

Enquiries about data or methodology should be addressed to:

Energy Data Centre – Energy Efficiency Indicators
Telephone: (+33-1) 40-57-67-44
E-mail: energyindicators@iea.org

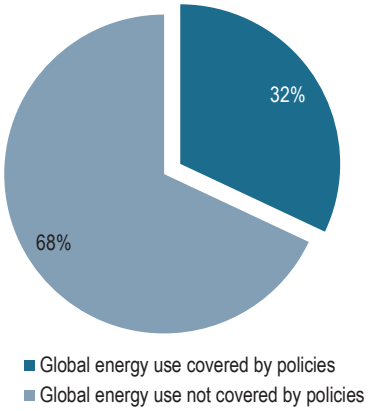
1. This document is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area. In this publication, "country" refers to a country or a territory, as the case may be.
2. The countries considered in this publication reflect IEA membership at the date of preparing this publication (October 2018).

ENERGY USE AND EFFICIENCY: KEY TRENDS IN IEA COUNTRIES

Energy efficiency is "the first fuel": it is key for cost-effective energy transitions and the one energy resource that all countries possess in abundance. Strong energy efficiency policies are vital to achieving key energy-policy goals, and the so-called "multiple benefits" of energy efficiency (IEA, 2014a), such as reducing energy bills, addressing climate change and air pollution, improving energy security, and increasing energy access. Still, global policy coverage[1] (32%) leaves many opportunities untapped and could be scaled up (IEA, 2018, Figure 1).

Reliable energy end-use data and indicators are key to inform and monitor the effectiveness of energy efficiency policies, as they show the drivers of energy demand.

Figure 1. Global energy use covered by policies



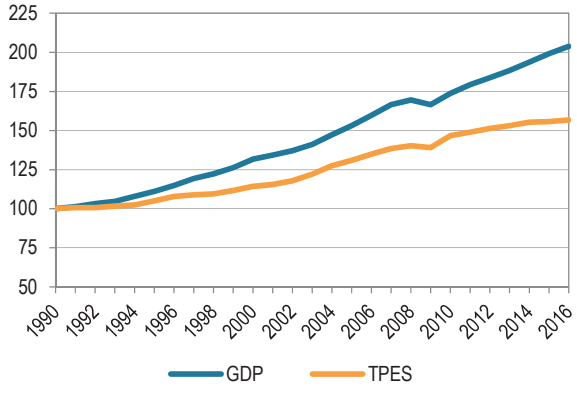
Sources: Adapted from IEA *Energy efficiency* 2018.

This report draws on previous editions of the *Energy efficiency indicators – Highlights,* providing an updated selection of data, collected by the IEA from member countries since 2009[2]. Based on such data, this chapter shows historical trends of energy use and an overview of the final energy-consuming sectors.

Global decoupling trends

Globally, energy use and economic development have been decoupling, with gross domestic product (GDP) more than doubling between 1990 and 2016, whereas total primary energy supply (TPES) grew by 57% (Figure 2).

Figure 2. World GDP and TPES trends (1990=100)



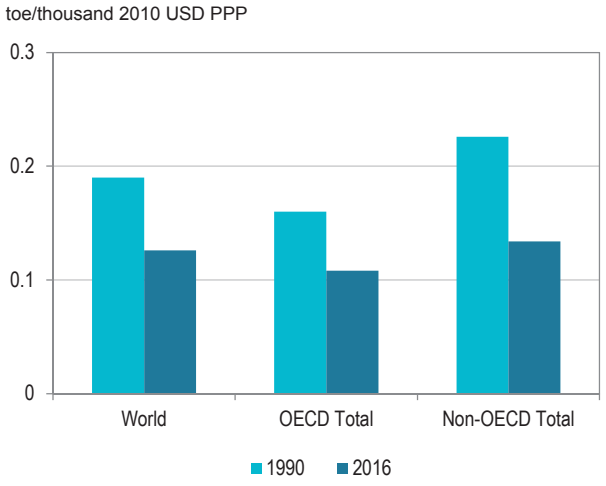
Sources: IEA *World energy balances* 2018 database; TPES: total primary energy supply; GDP based on 2010 USD, market exchange rate.

1. Policy coverage refers to the share of total final energy use that is estimated to be subject to a policy or regulation.

2. Time series collected generally start in 1990. This edition includes for the first time data for Morocco (IEA Association country) and four countries under the EU4Energy programme.

The amount of energy used to generate a unit of GDP, also called energy intensity of the economy (TPES/GDP) decreased globally by 34% between 1990 and 2016, with large regional variations (Figure 3). In non-OECD this fall has been greater. For example, in China[3], intensity more than halved (-70%) over this period.

Figure 3. Energy intensity 1990 and 2016



Sources: IEA *World energy balances* 2018 database; TPES: total primary energy supply; GDP based on 2010 USD PPP.

Is energy intensity an energy efficiency indicator?

The energy intensity of a country's economy is often used as an indicator of energy efficiency –mainly because, at an aggregate level, it is a proxy measurement for the energy required to satisfy the energy services demanded, and the fact that the indicator is relatively easily available to evaluate and compare across countries. However, a country with relatively low energy intensity does not necessarily have high energy efficiency. For instance, a small service-based country with a mild climate would have a lower intensity than a large industry-based country with a cold climate, even if energy is used more efficiently in the latter country. Equally, trends towards lower intensity are not necessarily driven by efficiency improvements.

Other elements also play a role in defining intensity levels and trends, including: the structure of the economy (share of large energy-consuming industries); geographic characteristics (e.g. longer distances implying higher demand for the transport sector); the overall climate and weather conditions (demand changes for heating or cooling); and the exchange rate (IEA, 2014b).

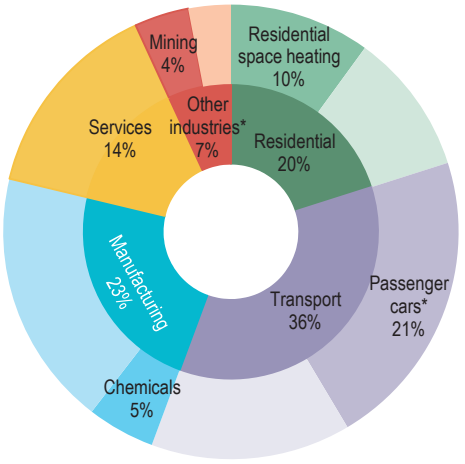
That's why it is important to conduct more detailed analysis that provides insight on the factors driving final energy use trends.

IEA[4] energy end-use and efficiency trends

Energy and emissions by end-use

In the IEA, the transport sector as a whole accounted for the highest share of final energy consumption[5] in 2016[6] (36%), followed by manufacturing industry (23%) and the residential sector (20%, Figure 4).

Figure 4. Largest end-uses by sector in IEA, 2016



* Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks.

3. Including the People's Republic of China and Hong Kong, China.

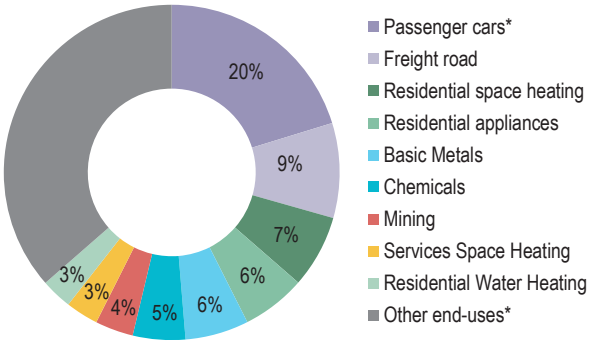
4. For Figures 4 to 14, the IEA aggregate refers to twenty IEA member countries for which energy efficiency data covering most end-uses are available: Australia, Austria, Canada, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, New Zealand, The Netherlands, Portugal, Spain, Switzerland, the United Kingdom and the United States. These countries represented about 89% of the total IEA final energy consumption for 2016.

5. In this publication, for the purposes of studying energy efficiency, final energy consumption is computed to include oil and gas extraction; coal mining; blast furnaces and coke ovens energy and transformation losses; and to exclude non-energy use, military consumption, and pipeline transport. This definition differs from that in the energy balances.

6. The latest year for which detailed energy use data were available for most IEA countries at the time of preparation of this publication.

Passenger cars alone used more energy than the whole residential sector and, together with freight road vehicles, they accounted for almost a third of final energy-related CO_2 emissions (Figure 5). Transports position as leading overall consumption is influenced by the fact that in United States, as in Canada and Australia, transport represented the largest consuming sector, in large extent, due to higher per-capita distances travelled and the use of larger vehicles.

Figure 5. Top ten CO_2 emitting end-uses in IEA, 2016



* Passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-ten.

The manufacturing sector, driven by the ferrous metals and chemicals sub-sectors, shows large shares in Japan and Korea; and the share of the residential sector, with energy use dominated by space heating and appliances, was largest mainly in European countries.

In almost all the IEA countries, emissions for both residential space heating and appliances were larger than those of any manufacturing sub-sector (Figure 5); in some countries, like Czech Republic, space heating was the largest emitting end-use.

Residential sector

Space heating accounted for nearly half of the IEA energy consumption in the residential sector (Figure 6), with the highest shares in European countries (Hungary 75% and the United Kingdom 71%) and typically the lowest shares in Asia and Oceania (Japan 26% and New Zealand 30%).

Energy efficiency improvements for space heating have occurred across IEA countries, mostly due to better insulation of buildings, refurbishment of old buildings, and improvements in heating equipment. The effects are tracked by trends in residential space heating intensity – defined as energy consumption per floor area – which significantly decreased in most IEA countries (Figure 7). For instance, Netherlands, Portugal, Germany and Ireland have experienced reductions of over 35% since 2000.

Warmer countries generally have lower space heating intensities, as less energy is needed on average to keep the indoor temperature at a comfort level.

Figure 6. Shares of residential energy consumption by end-use in IEA, 2016

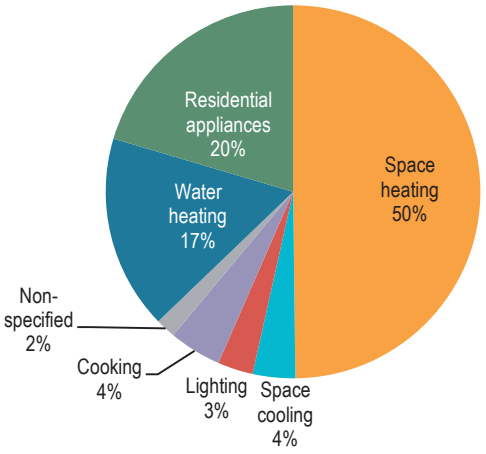
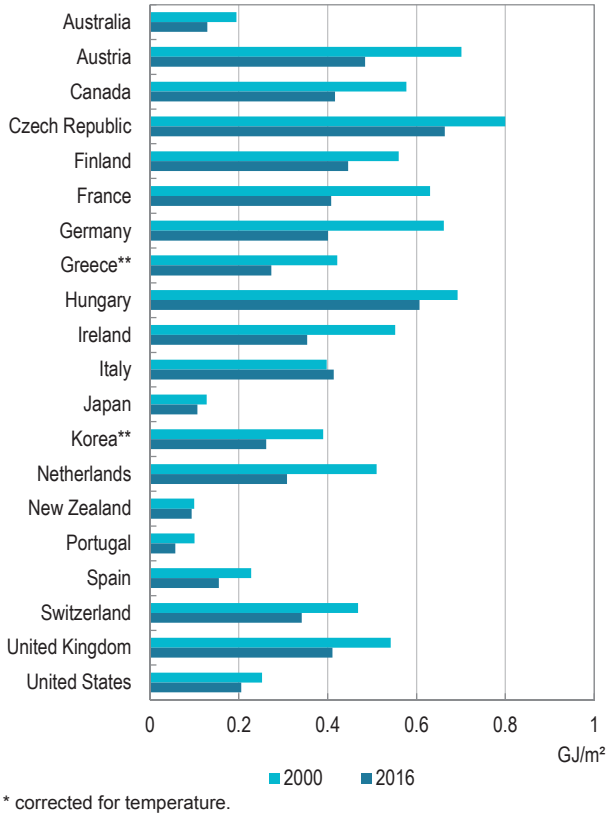


Figure 7. Energy intensity* per floor area of residential space heating by country



* corrected for temperature.
** refers to 2015 data.

Industry and services[7]

In the IEA, the largest energy-consuming manufacturing sub-sector were ferrous metals and chemicals (21% each), followed by paper and printing (13%) and food and tobacco (10%, Figure 8).

In terms of structure of the manufacturing sector, the largest value added in the IEA was the machinery sub-sector[8] (37%), followed by transport equipment (15%) and chemicals (14%, Figure 9).

Figure 8. Shares of manufacturing energy consumption by sub-sector in IEA, 2016

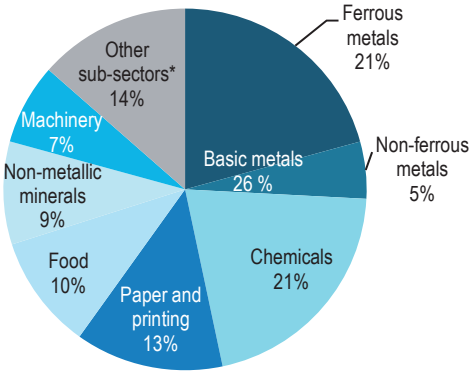
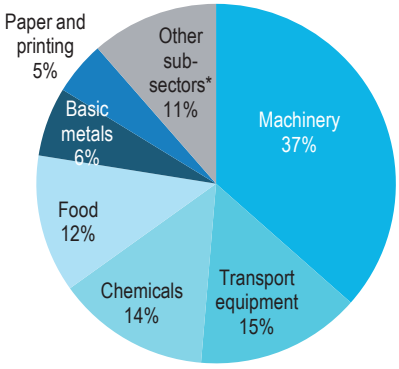
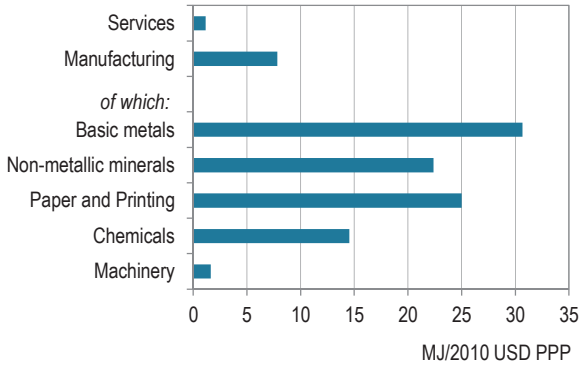


Figure 9. Shares of manufacturing value added by sub-sector in IEA, 2016



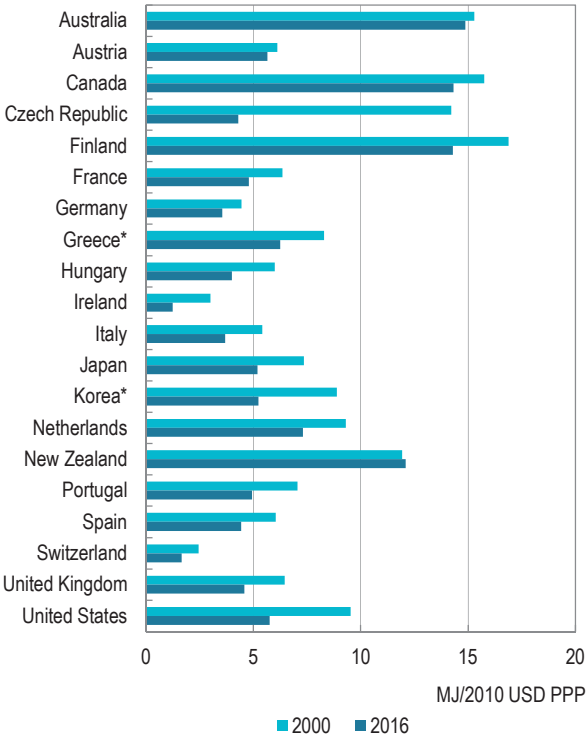
The intensities of the manufacturing sub-sectors (energy consumption per value added) vary greatly (Figure 10). Within manufacturing, basic metals and non-metallic minerals are the most energy intensive sub-sectors, while machinery is the least intensive one. The energy intensity of services is lower than that of all manufacturing sub-sectors.

Figure 10. Manufacturing and services: selected intensities in IEA, 2016



The manufacturing energy intensity of a country depends on the relative weight of the different sub-sectors in the manufacturing mix. For example, intensity is particularly high in countries like Finland (Figure 11), where the very energy-intensive paper and printing industry represented about 57% of total manufacturing energy consumption in 2016.

Figure 11. Energy intensity of manufacturing by country, 2000-2016



* refers to 2015 data.

7. In this publication, the services sector is analysed together with industry due to limitations in end-use data availability. Industry includes manufacturing industry, agriculture/fishing, mining and construction.

8. Includes ISIC Divisions 25-28: Manufacture of fabricated metal products, except machinery and equipment; manufacture of computer, electronic and optical products; manufacture of electrical equipment; manufacture of machinery and equipment n.e.c.

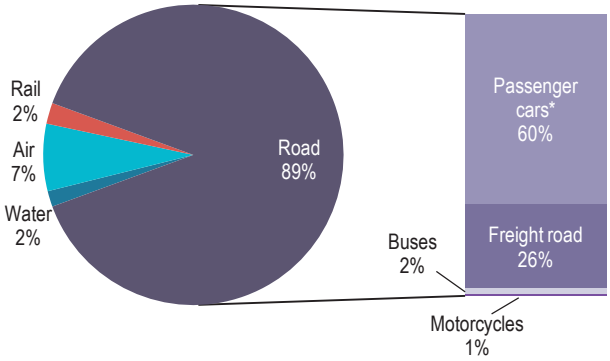
Overall, manufacturing intensity has decreased over time in most IEA countries. For example, in the United States it decreased 40% between 2000-2016, due to efficiency improvements mainly in chemicals and basic metals, but also because of increasing shares of less intensive sub-sectors, like machinery.

Changes over time in the importance of different sub-sectors in the manufacturing mix can significantly affect its overall intensity, as does a change in the economic structure from manufacturing to services. Identifying and removing the effects of structural changes from those of energy efficiency is therefore essential (see section *Cross sectoral energy efficiency trends* below).

Transport

Energy consumption for transport[9] in the IEA is dominated by road vehicles (89%), with passenger cars and freight road together representing about 86%. Air accounts for 7%; water and rail transport account together for roughly 4% (Figure 12).

Figure 12. Energy consumption in transport in IEA, 2016

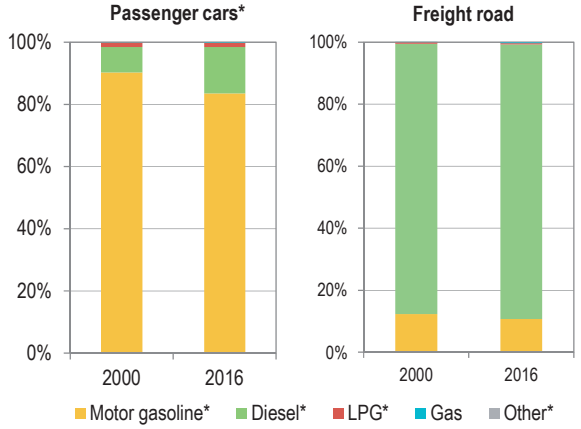


* Passenger cars includes cars, sport utility vehicles and personal trucks.

Across IEA countries, motor gasoline[10] remains the dominant fuel for passenger cars even though the share of diesel increased from 8% in 2000 to 15% in 2016. Freight road energy consumption is dominated by diesel in all countries (Figure 13).

Passenger transport intensity (energy per passenger-kilometre) indicates the amount of energy used to move one passenger over a distance of one km. Intensity levels vary across countries depending on the share of modes (e.g. road, air, water, rail), vehicle types in the mix (e.g. passenger cars, buses, etc.) and on the average occupancy (passengers per vehicle) – which in many countries has decreased over time.

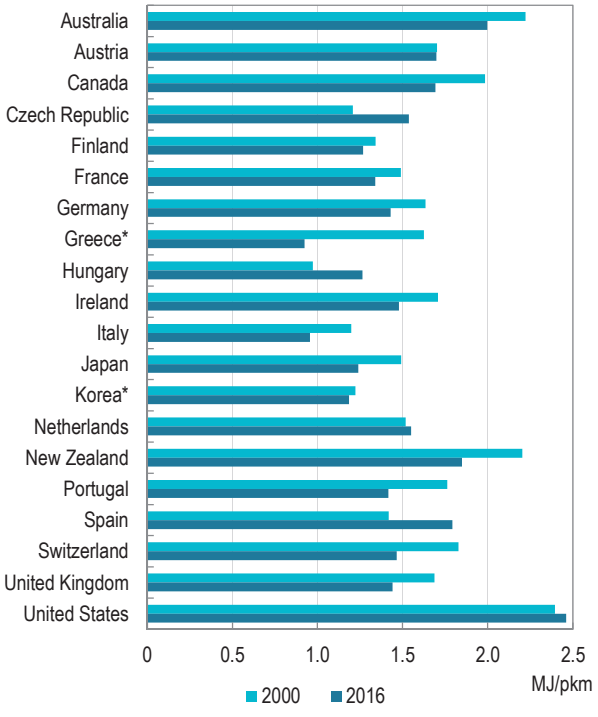
Figure 13. Energy consumption in road transport



*Passenger cars includes cars, sport utility vehicles and personal trucks.

Passenger transport intensity is particularly high in countries like the United States, due to the large use of passenger cars (with a high share of Sport Utility Vehicles, SUVs) and domestic flights, compared to more efficient transportation like buses and trains. Conversely, it is lower in countries like France, where rail transport is quite common (Figure 14).

Figure 14. Energy intensity of passenger transport by country, 2000-2016



* refers to 2015 data.

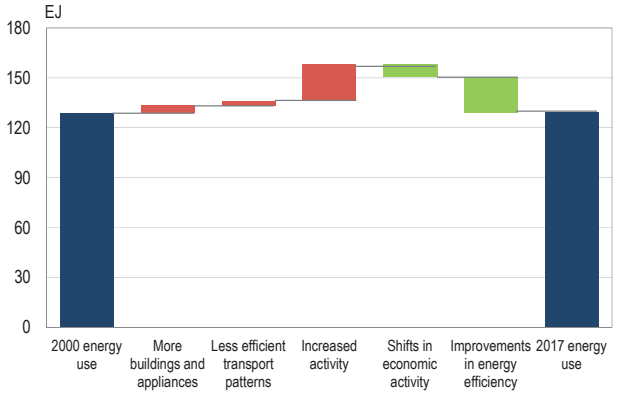
9. Transport excludes international aviation and marine bunkers, pipeline.
10. In this publication, gasoline and diesel include the biofuel components.

Passenger transport intensity has been decreasing in most countries due to modal shift and improvements in passenger cars efficiency, like in Switzerland (-17% from 2000-2016). However, improvements have been partly offset by lower occupancy of vehicles.

Cross-sectoral energy efficiency trends

Globally, the impact of energy efficiency is being overwhelmed by increasing levels of economic activity across all sectors, which with behavioural changes means global energy demand continues to increase. However, within the IEA, decomposition analysis[11] shows how improvements in energy efficiency across all sectors, combined with shifts in economic activity, have offset the impact of activity growth and changing consumption patterns since 2000 (Figure 15)[12].

Figure 15. Drivers of final energy consumption in IEA



Source: adapted from IEA (2018) *Energy Efficiency 2018,* based on IEA Energy efficiency indicators database, 2018.

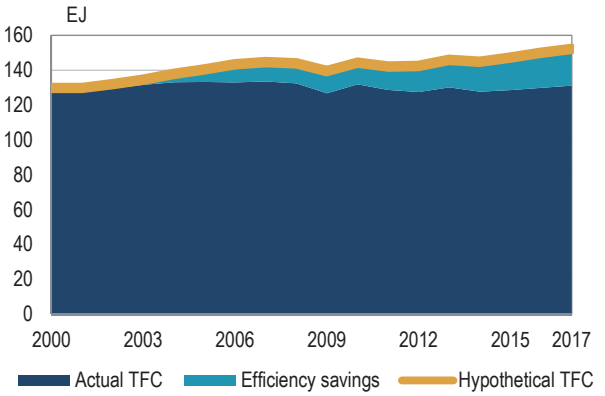
Multiple factors are pushing energy use upwards in IEA countries. In the residential sector, increases in building floor area and appliance ownership, both driven by population growth, represented a 3% increase in energy use. Similarly, less efficient transport patterns, including shifts to more intensive transport modes, such as larger passenger cars like SUVs, represented over 2% more energy use.

Increasing activity levels, linked to population growth, distance travelled, passengers and load transported and economic value produced, represented a 17% increase in demand in IEA member countries.

These factors have been offset mainly by changes in economic structure, particularly the shift in economic activity from energy-intensive manufacturing towards less intensive ones and services. These shifts offset about 25% of the impact from increased activity.

The largest factor putting downward pressure on energy use in IEA member countries has been improvements in energy efficiency. Energy efficiency gains have been critical in keeping total final energy consumption (TFC) in IEA member countries around the same level as 2000. Without these efficiency gains, TFC in IEA member countries would have been 16% higher (Figure 16).

Figure 16. Estimated energy efficiency savings in IEA



Source: adapted from IEA (2018) *Energy efficiency 2018,* based on the IEA Energy efficiency indicators database, 2018.

The estimated energy savings due to efficiency improvements since 2000 in IEA reached approximately 21 EJ in 2017, equivalent to the final energy consumption of Germany, France and the United Kingdom combined.

Improvement in transport sector efficiency has been slower, particularly for freight transport, with few IEA members having adopted truck fuel economy standards (IEA, 2018).

References

IEA (2014a) *Capturing the multiple benefits of energy efficiency,* OECD/IEA, Paris.

IEA (2014b) *Energy Efficiency Indicators: Fundamentals on Statistics,* OECD/IEA, Paris.

IEA (2018) *Energy efficiency 2018*, OECD/IEA, Paris.

11. Please refer to the *Methodological notes* for a description of the IEA decomposition analysis.
12. Additional decomposition analysis is provided in *Energy Efficiency 2018*.

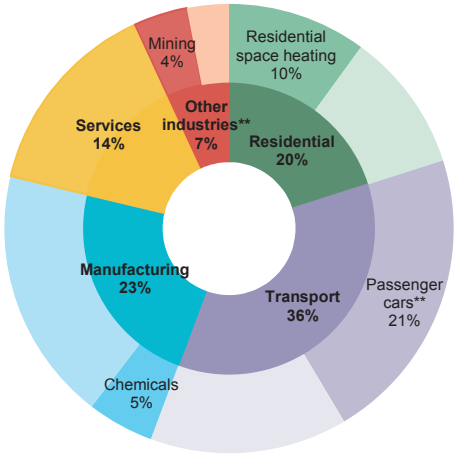
PART I

IEA MEMBER COUNTRIES

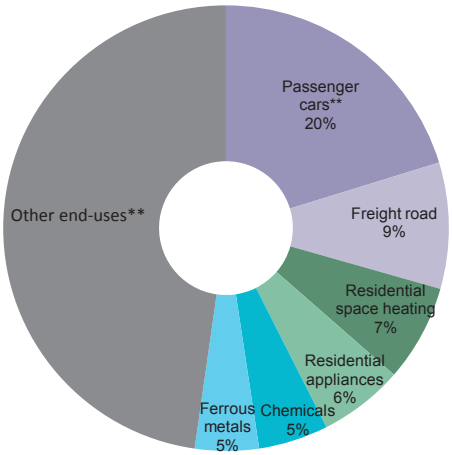
IEA*

Cross-sectoral overview

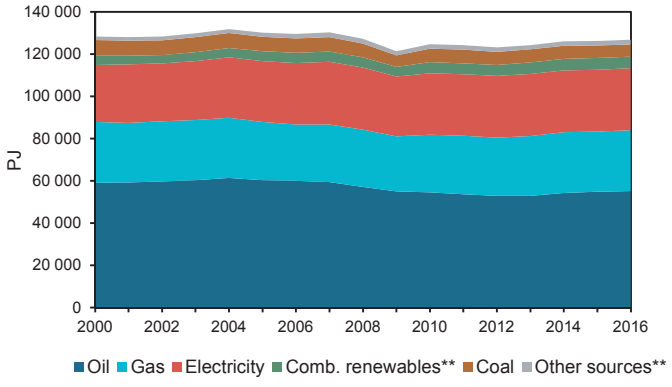
Largest end-uses by sector, 2016



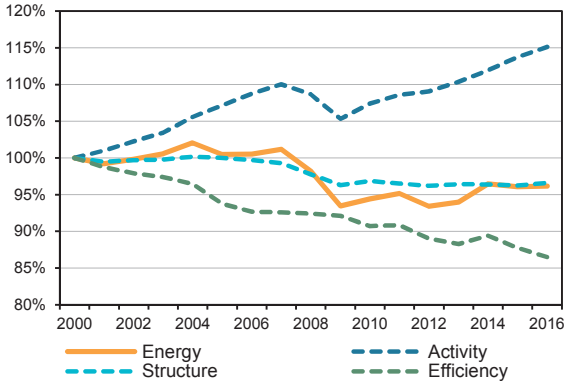
Top six CO_2 emitting end-uses, 2016***



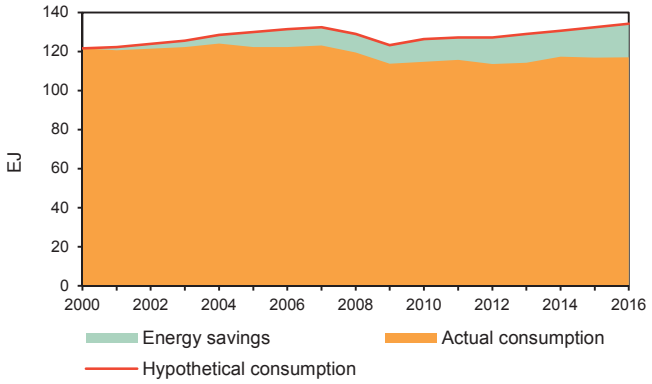
Final energy consumption by source



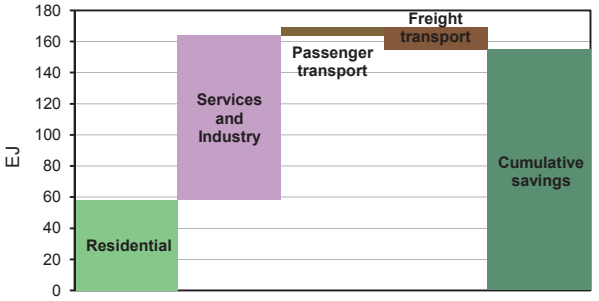
Drivers of final energy consumption****



Estimated energy savings from efficiency****



Estimated cumulative energy savings by sector, 2000-16****



*The IEA aggregate refers to the twenty IEA member countries for which energy efficiency data covering most of the end-uses are available: Australia, Austria, Canada, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, New Zealand, The Netherlands, Portugal, Spain, Switzerland, the United Kingdom and the United States. These countries represented about 89% of the total IEA final energy consumption for 2016.

**Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

***Includes emissions reallocated from electricity and heat generation.

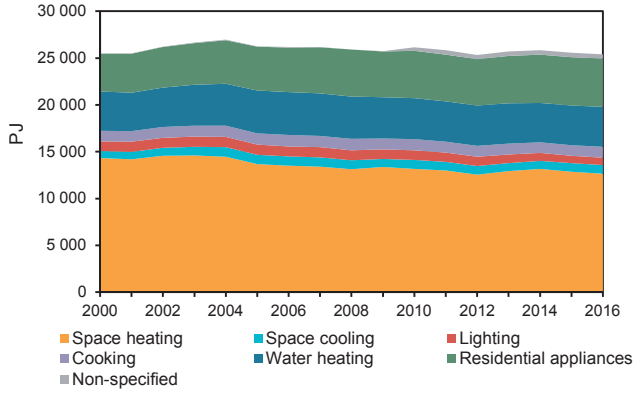
****These figures display results from the IEA decomposition analysis and cover approximately 94% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

IEA

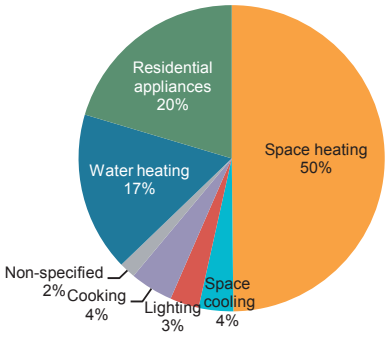
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	25 506	79	888	29	126	2.7
2016	25 403	73	973	26	126	2.5

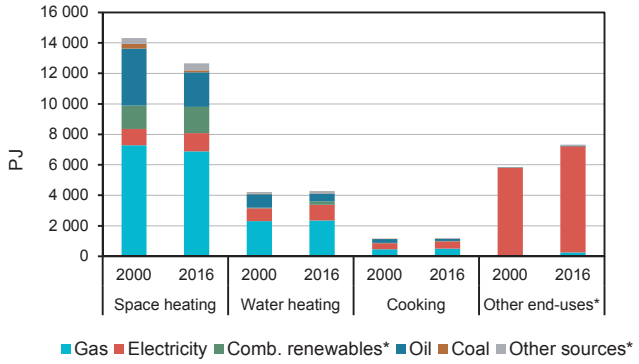
Residential energy consumption by end-use



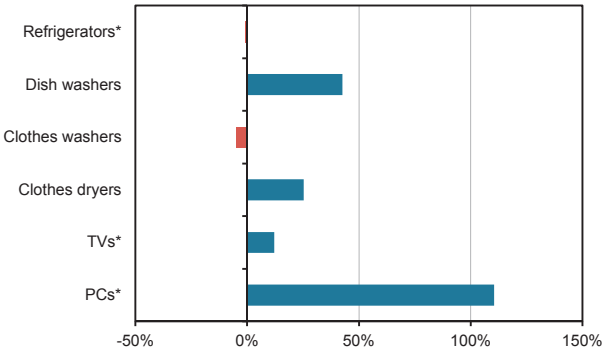
Residential energy consumption by end-use, 2016



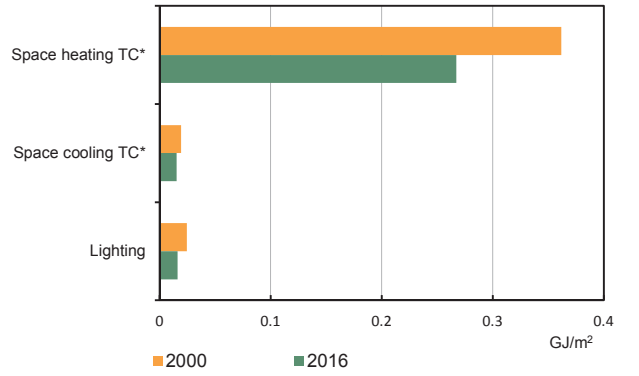
Residential energy consumption by source



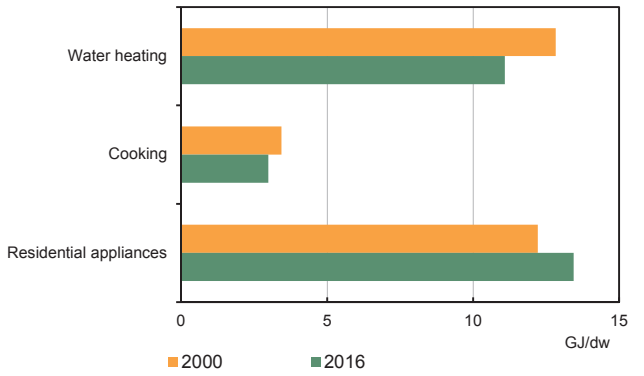
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



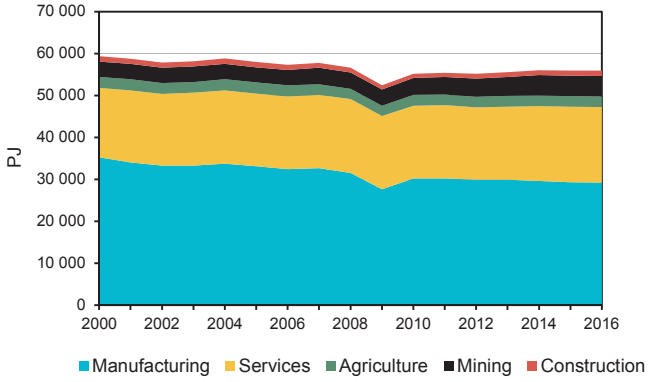
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

IEA

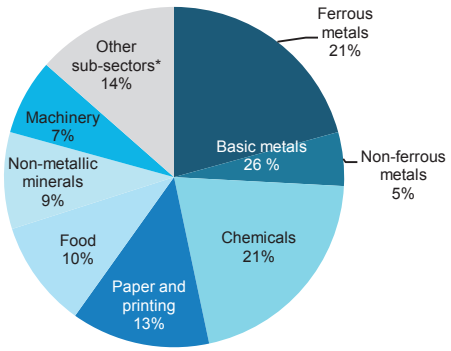
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	35 217	16 353	7 557	32 527	4 477	21 643
2016	29 200	17 824	8 686	41 646	5 499	28 379

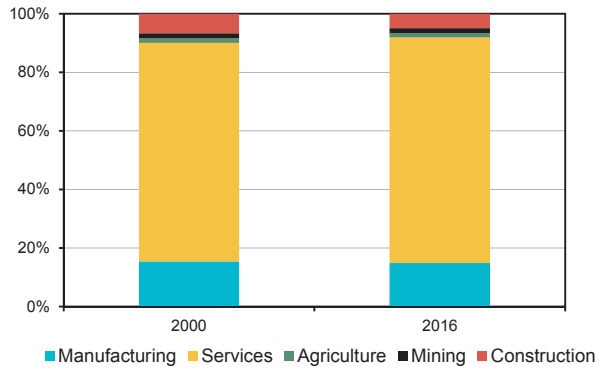
Industry and services energy consumption



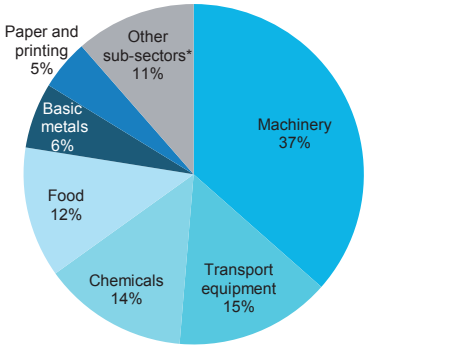
Manufacturing energy consumption by sub-sector, 2016



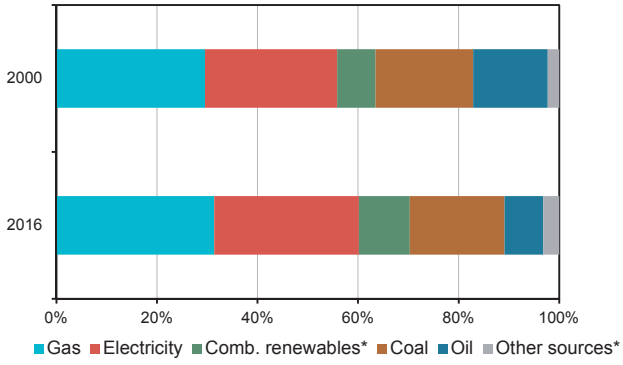
Value added** by sector



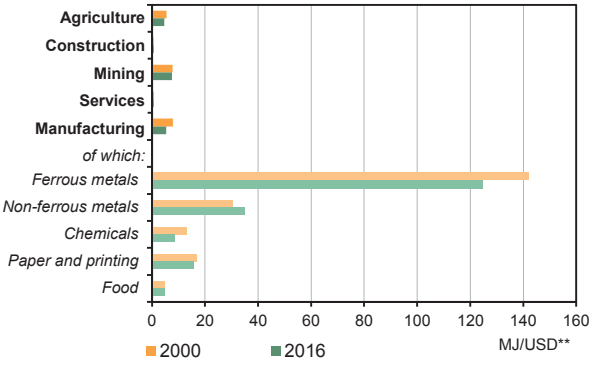
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



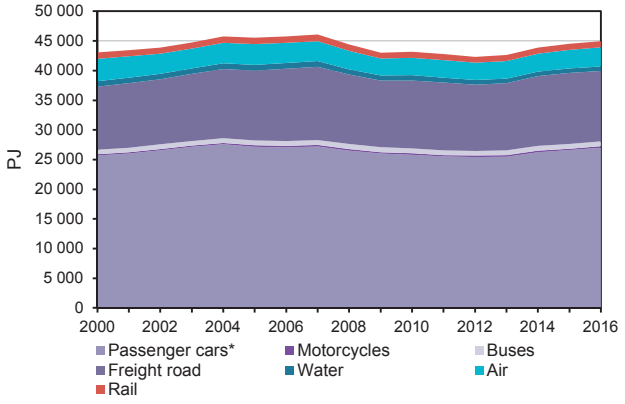
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

IEA

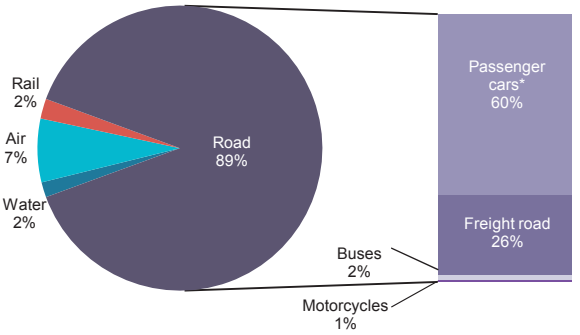
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	30 822	12 217	15 565	10 297	1.6	3.8
2016	31 732	13 217	16 663	10 499	1.5	3.4

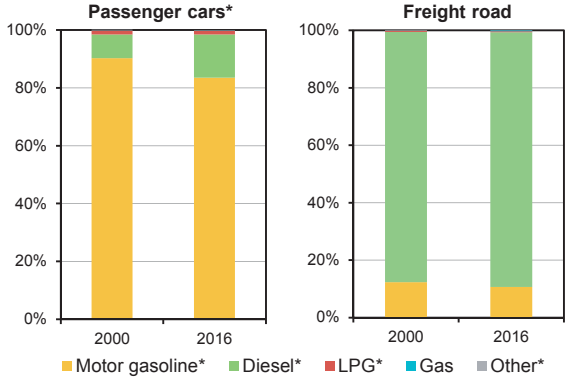
Transport energy consumption by mode/vehicle type



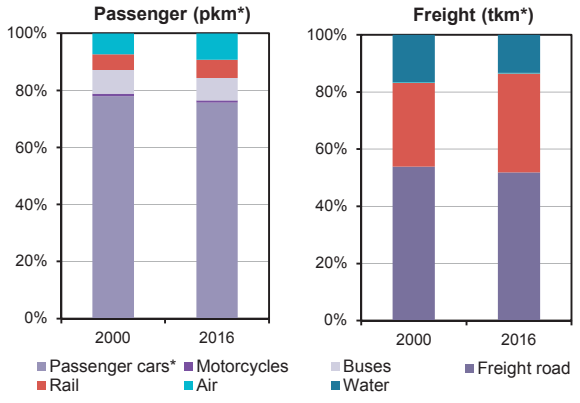
Transport energy consumption by mode/vehicle type, 2016



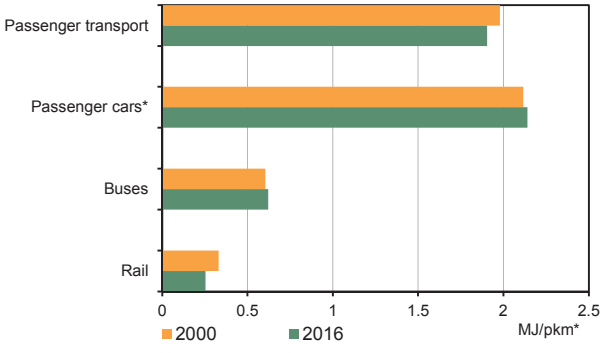
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



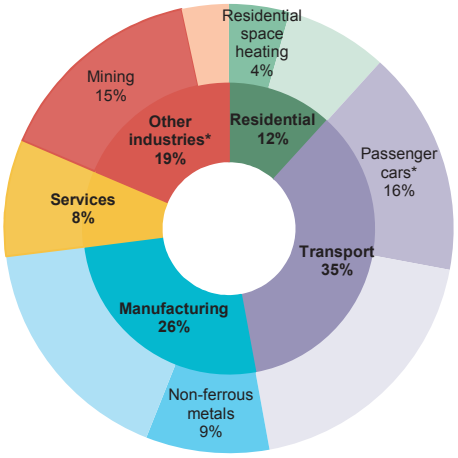
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

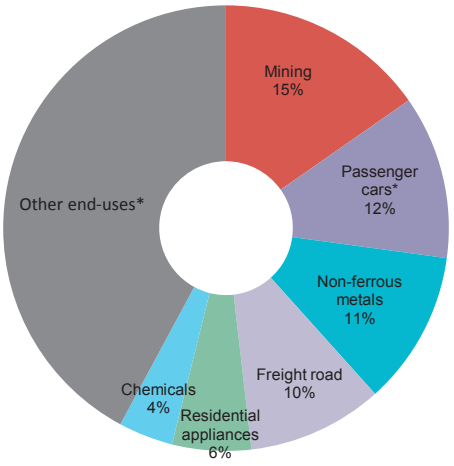
AUSTRALIA

Cross-sectoral overview

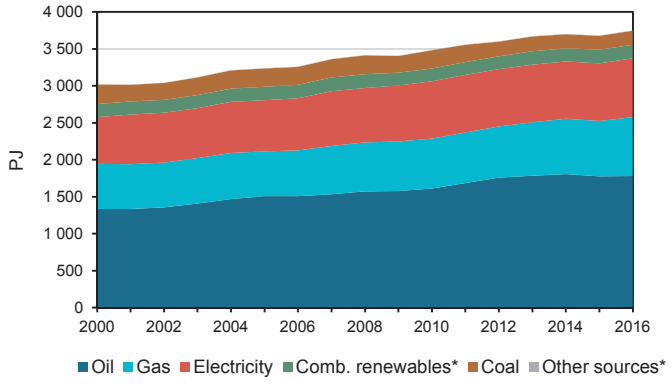
Largest end-uses by sector, 2016



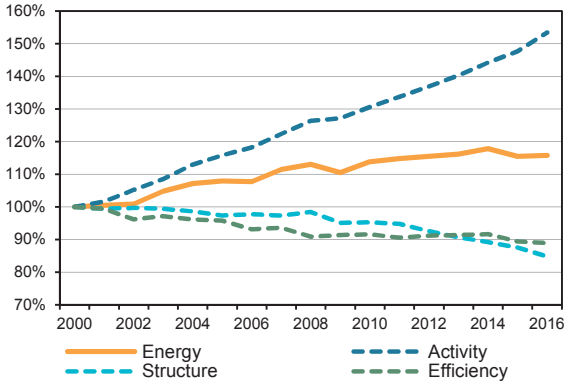
Top six CO_2 emitting end-uses, 2016**



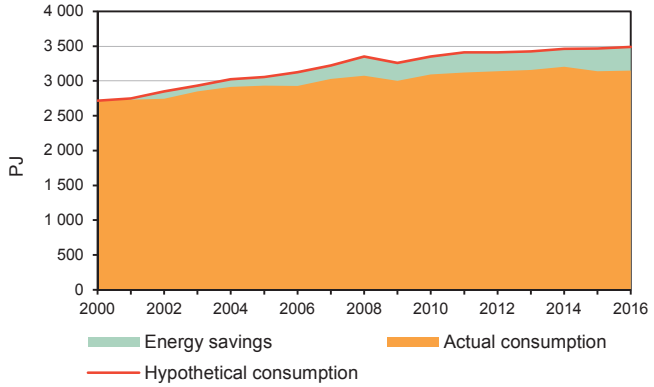
Final energy consumption by source



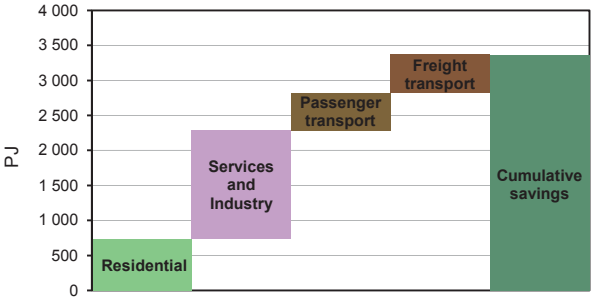
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

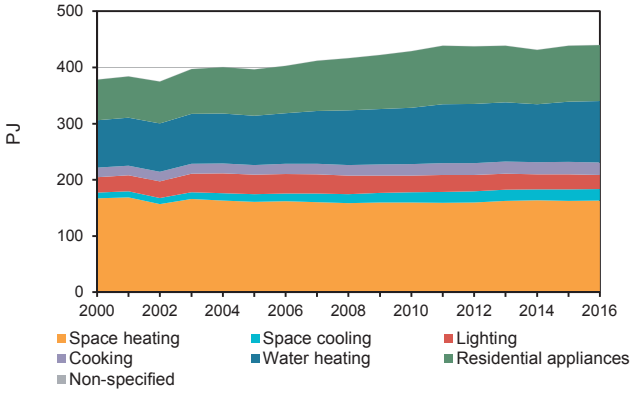
***These figures display results from the IEA decomposition analysis and cover approximately 89% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

AUSTRALIA

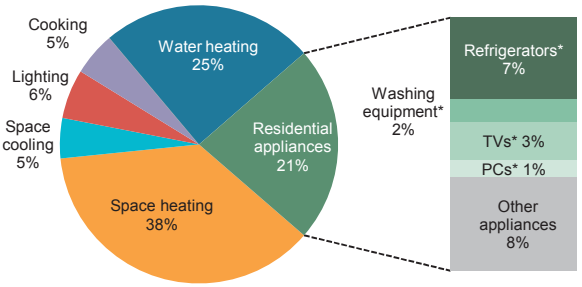
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	378	44	19	20	114	2.6
2016	440	58	23	19	164	2.6

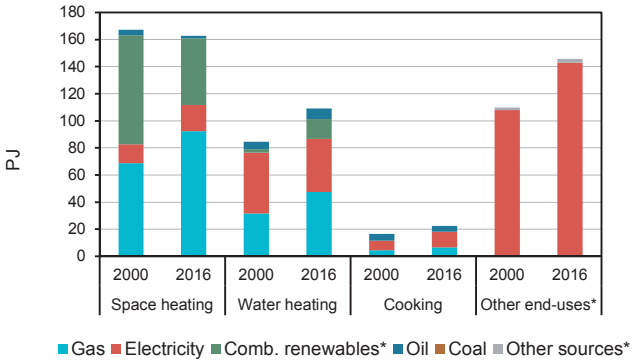
Residential energy consumption by end-use



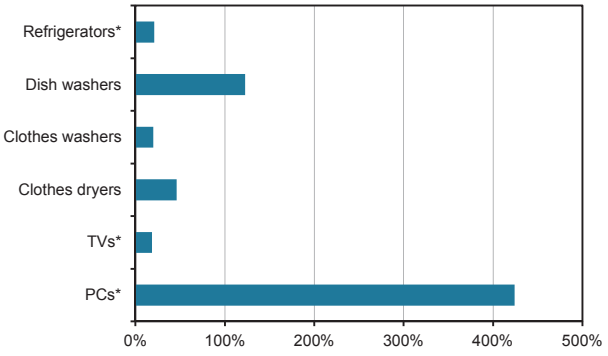
Residential energy consumption by end-use, 2016



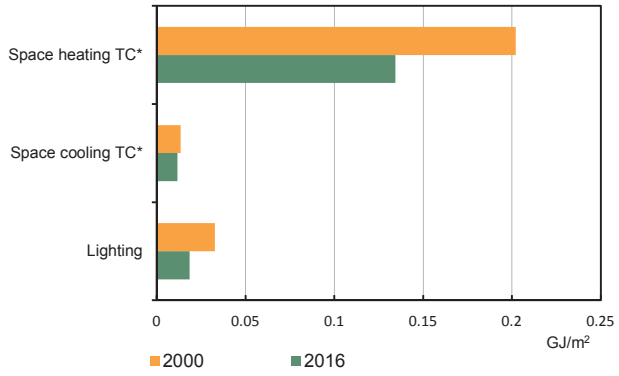
Residential energy consumption by source



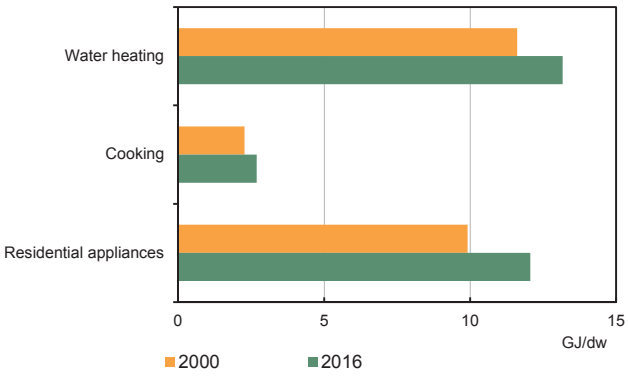
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



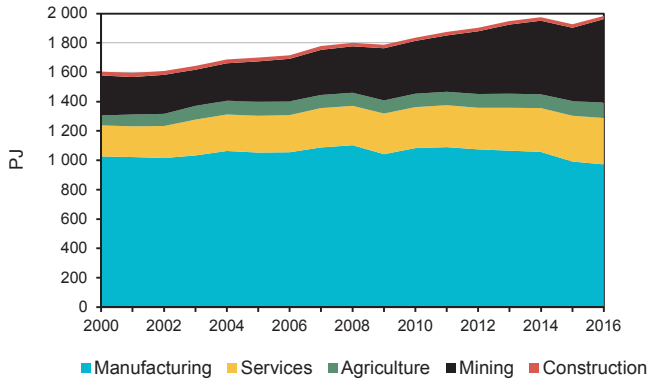
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes TVs only; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

AUSTRALIA

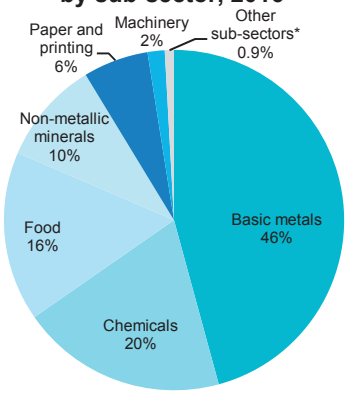
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	1 026	212	366	693	67	286
2016	972	315	696	1 099	65	510

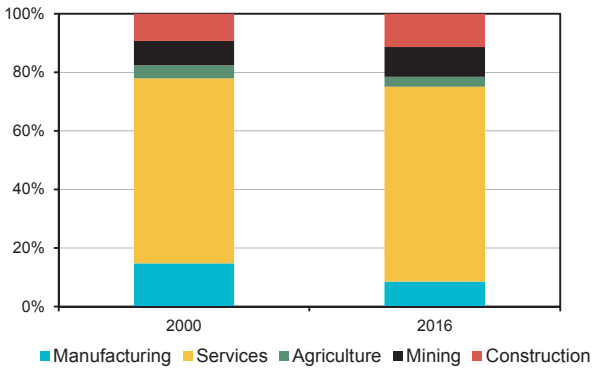
Industry and services energy consumption



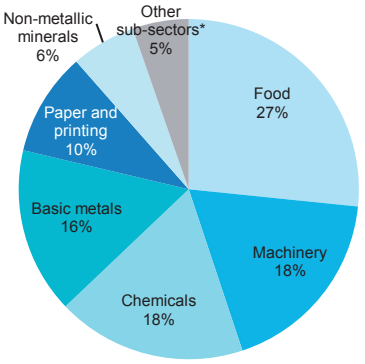
Manufacturing energy consumption by sub-sector, 2016



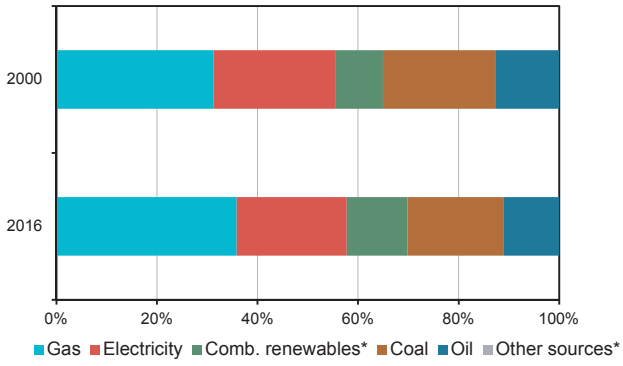
Value added** by sector



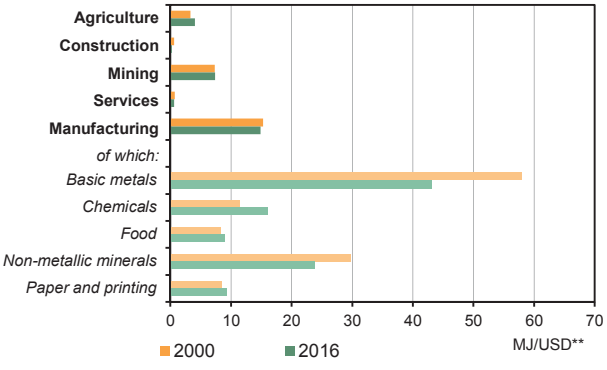
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



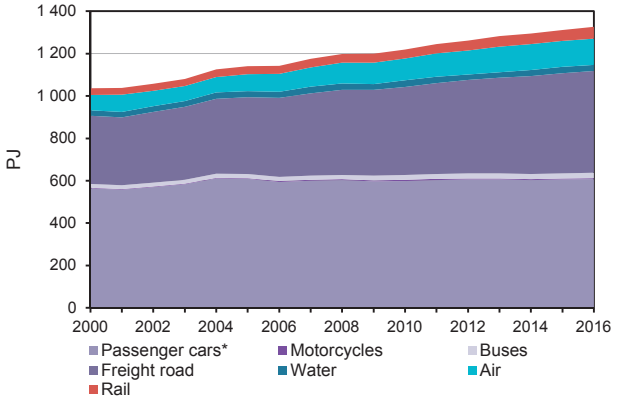
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

AUSTRALIA

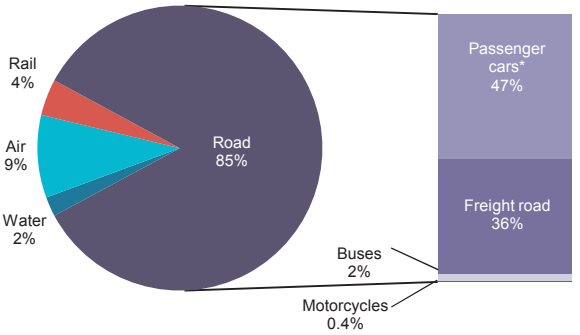
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	673	364	303	375	1.6	3.0
2016	783	543	392	738	1.6	3.1

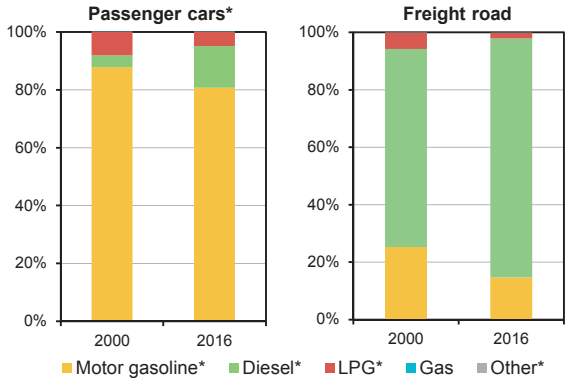
Transport energy consumption by mode/vehicle type



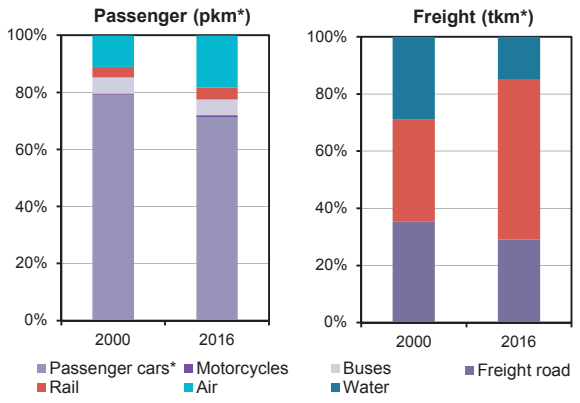
Transport energy consumption by mode/vehicle type, 2016



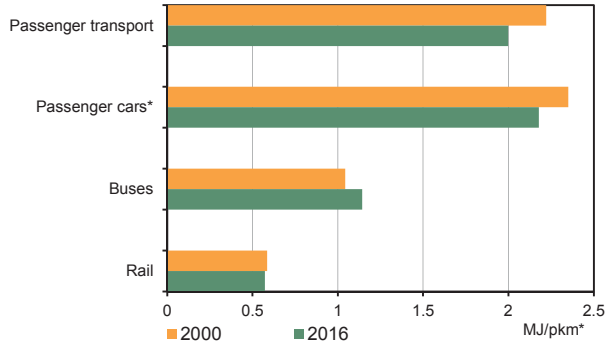
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



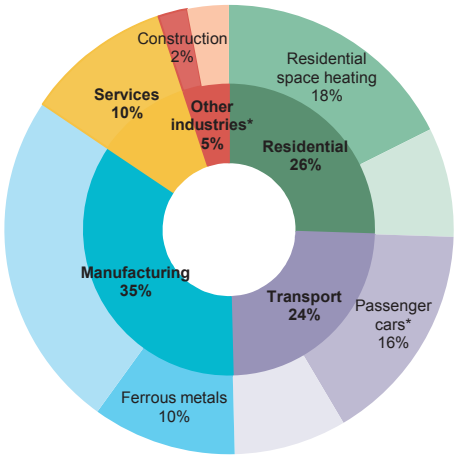
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

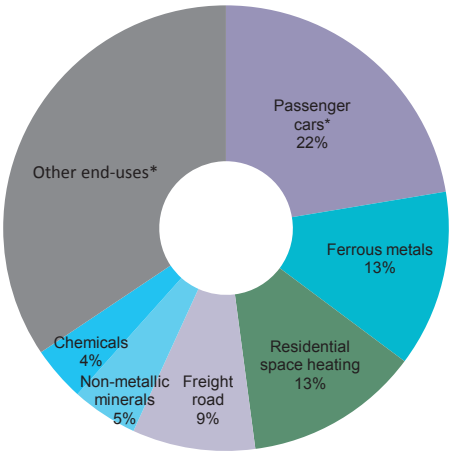
AUSTRIA

Cross-sectoral overview

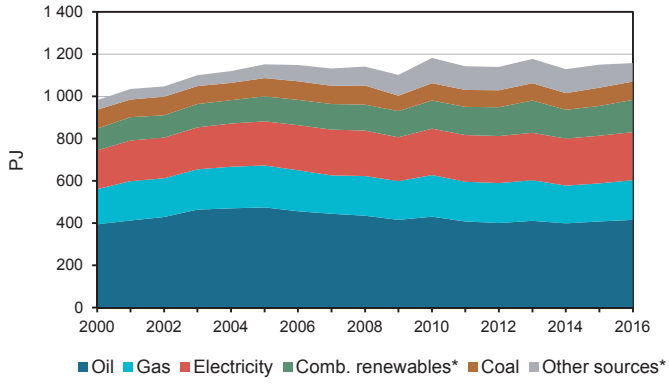
Largest end-uses by sector, 2016



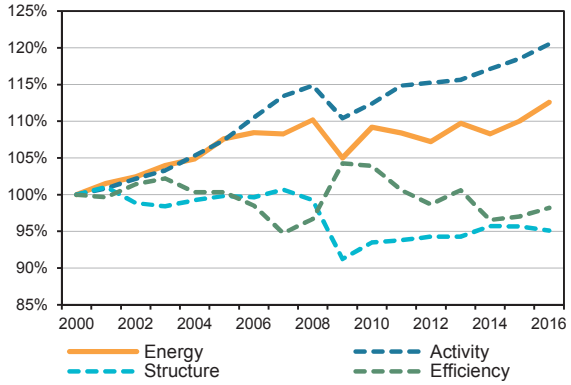
Top six CO_2 emitting end-uses, 2016**



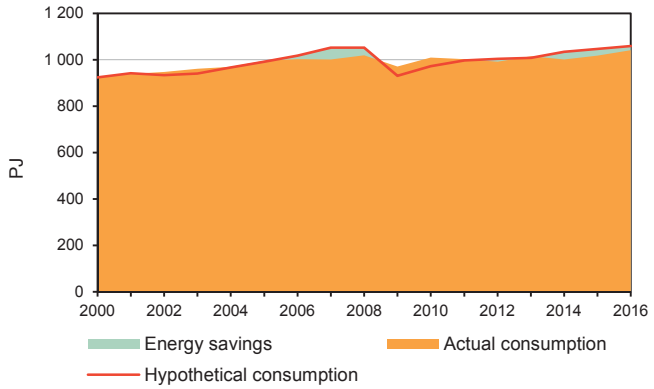
Final energy consumption by source



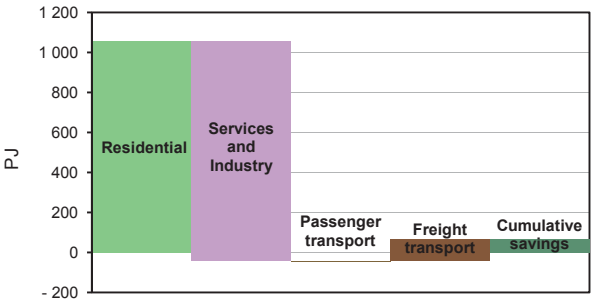
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

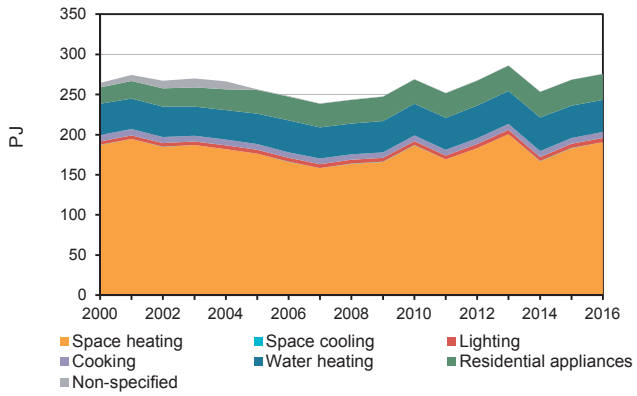
***These figures display results from the IEA decomposition analysis and cover approximately 97% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

AUSTRIA

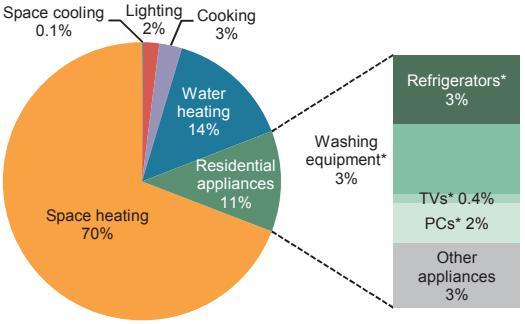
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	264	60	8	33	91	2.5
2016	276	43	9	32	99	2.3

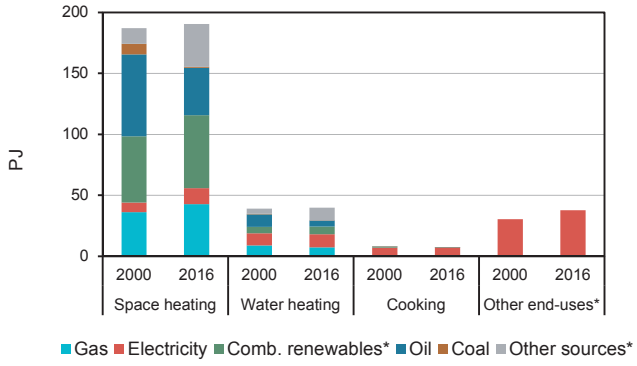
Residential energy consumption by end-use



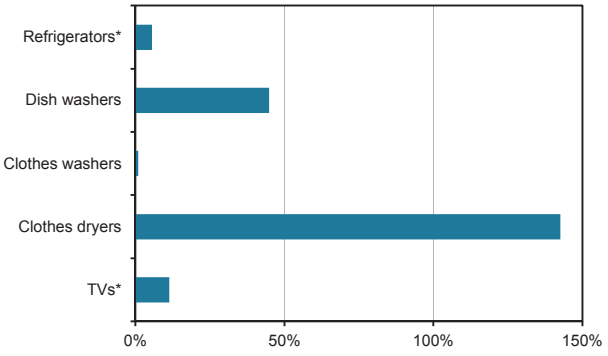
Residential energy consumption by end-use, 2016



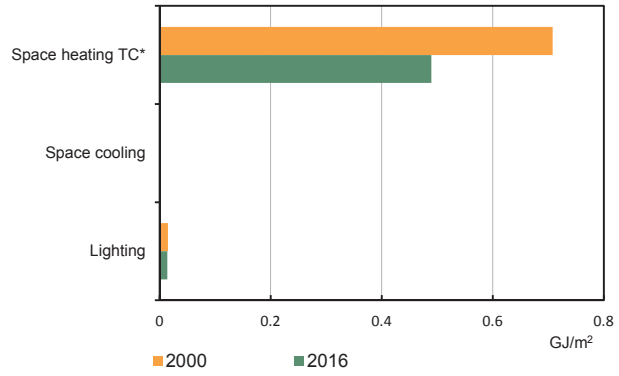
Residential energy consumption by source



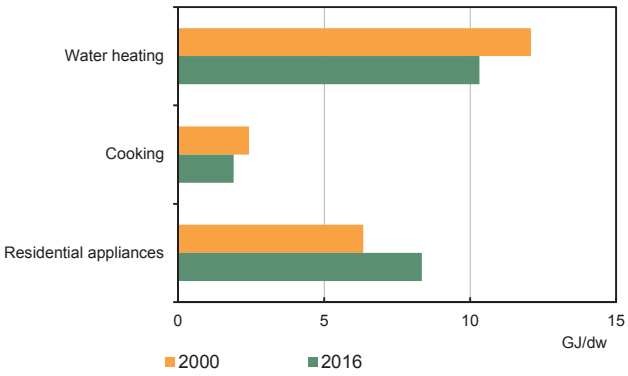
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



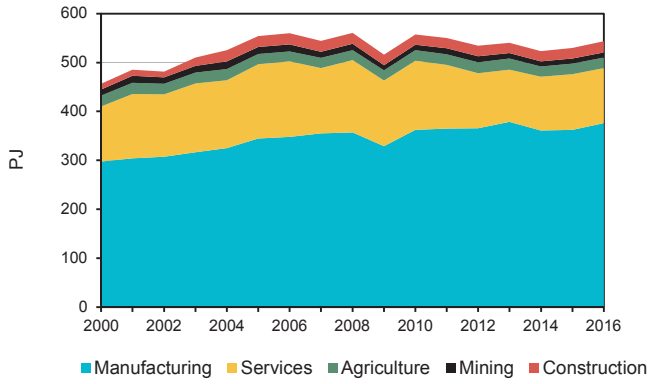
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

AUSTRIA

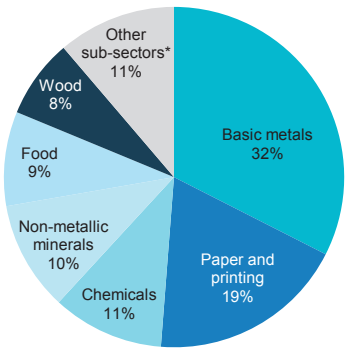
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	297	113	46	303	49	182
2016	376	113	55	376	67	237

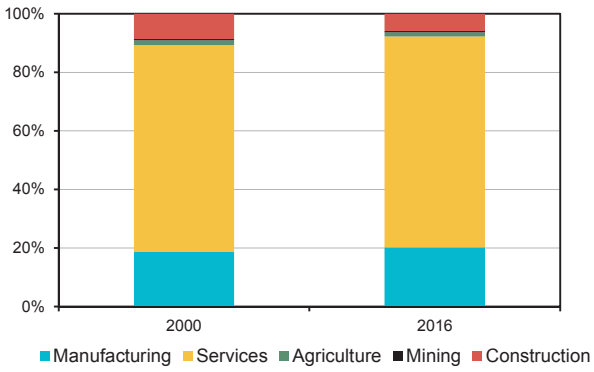
Industry and services energy consumption



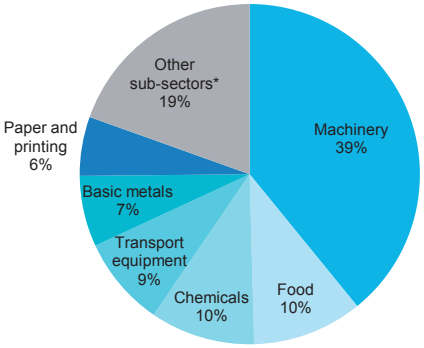
Manufacturing energy consumption by sub-sector, 2016



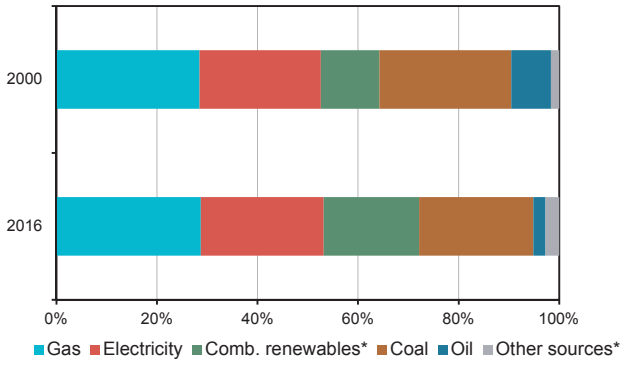
Value added** by sector



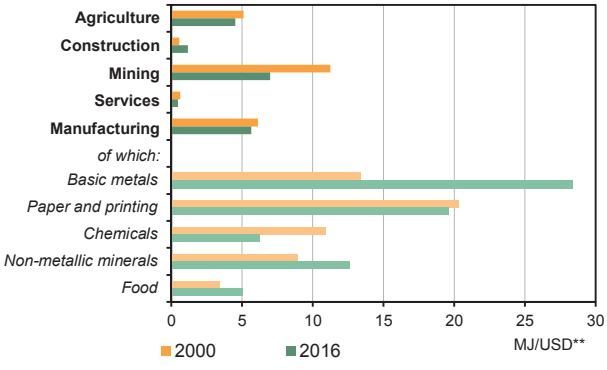
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



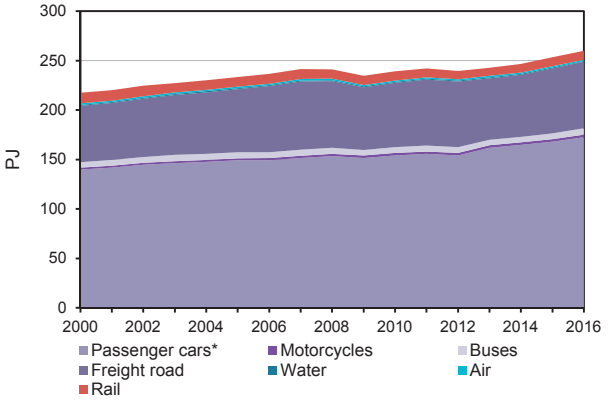
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

AUSTRIA

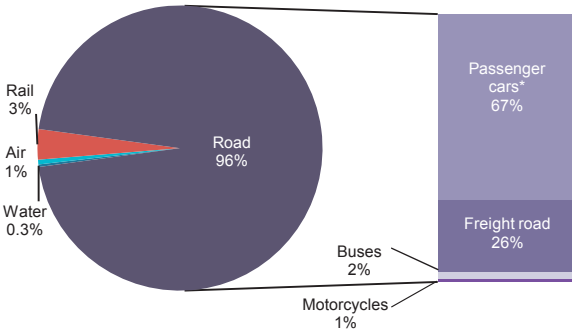
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	153	64	90	56	1.2	4.1
2016	187	73	110	75	1.2	4.3

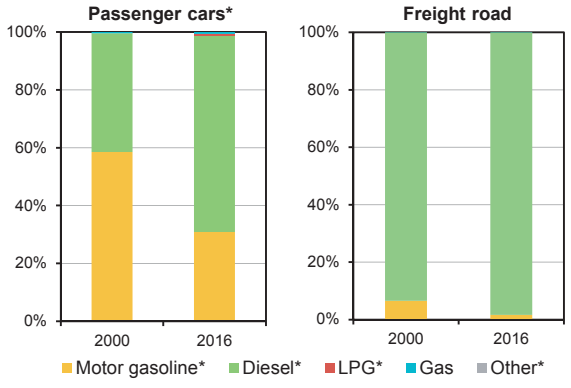
Transport energy consumption by mode/vehicle type



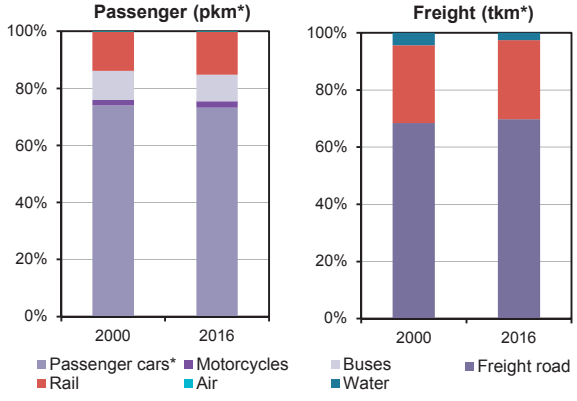
Transport energy consumption by mode/vehicle type, 2016



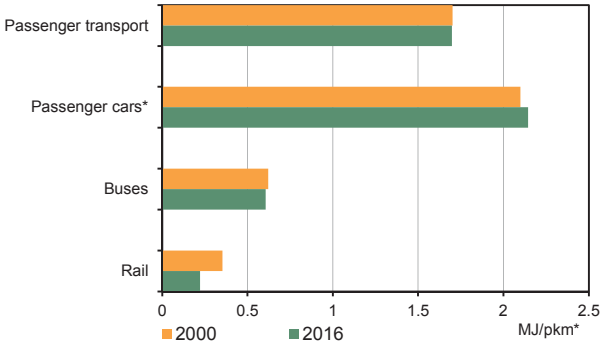
Energy consumption in road transport by source



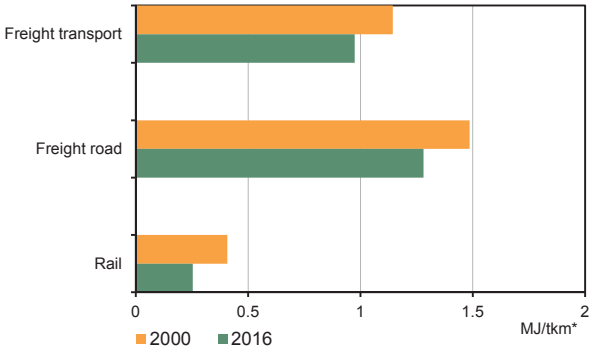
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport

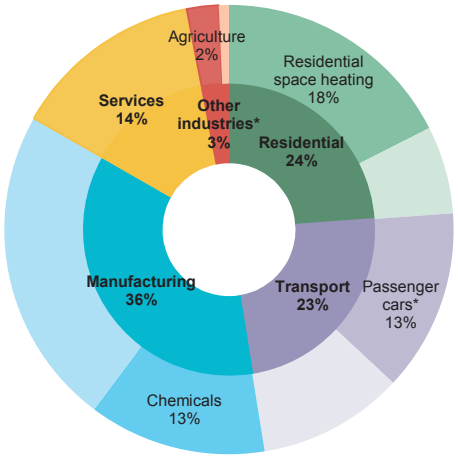


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

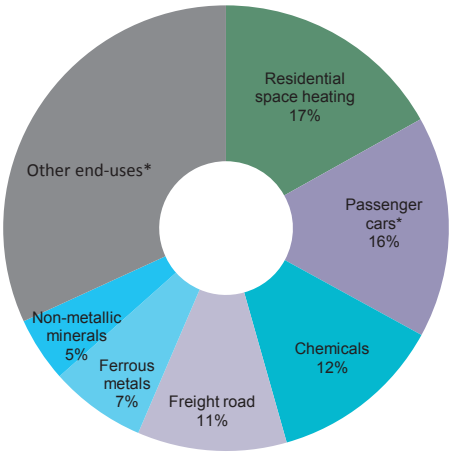
BELGIUM

Cross-sectoral overview

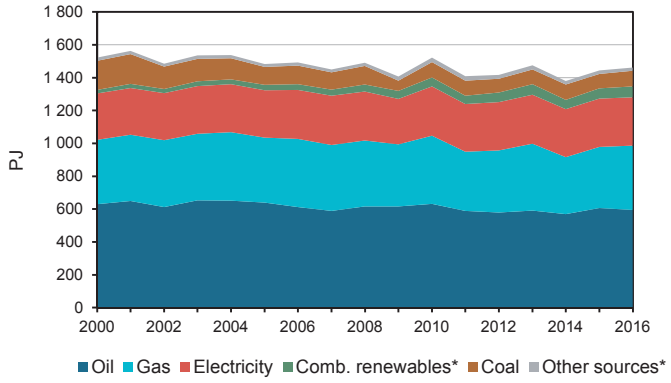
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

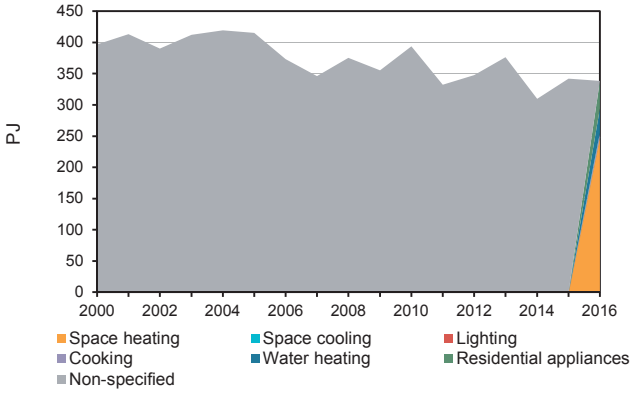
**Includes emissions reallocated from electricity and heat generation.

BELGIUM

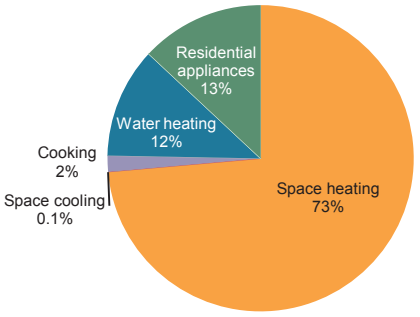
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	397	NA	10	39	82	2.5
2016	338	87	11	30	81	2.4

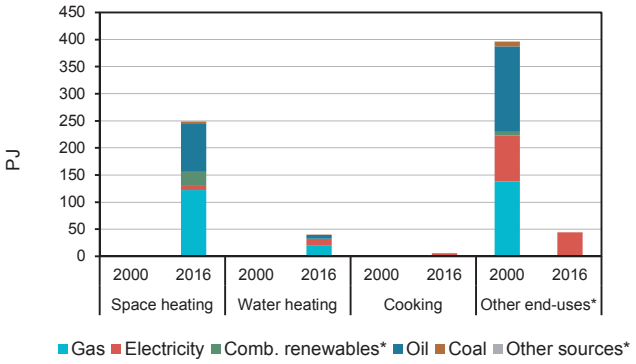
Residential energy consumption by end-use



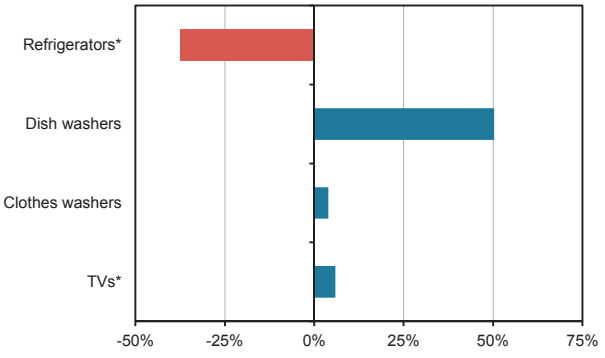
Residential energy consumption by end-use, 2016



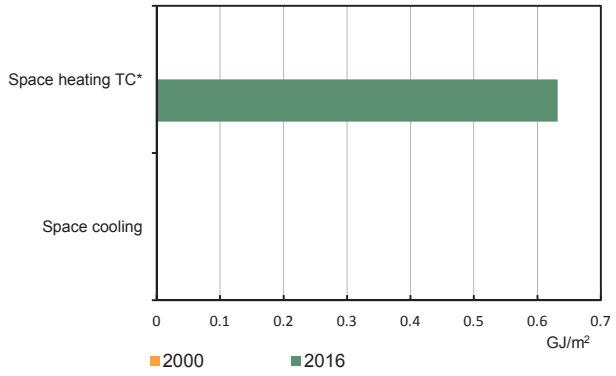
Residential energy consumption by source



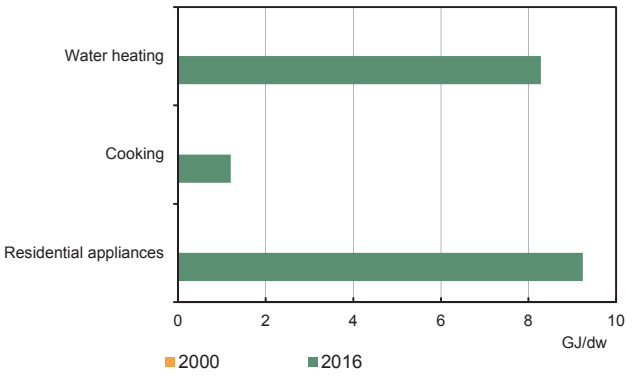
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



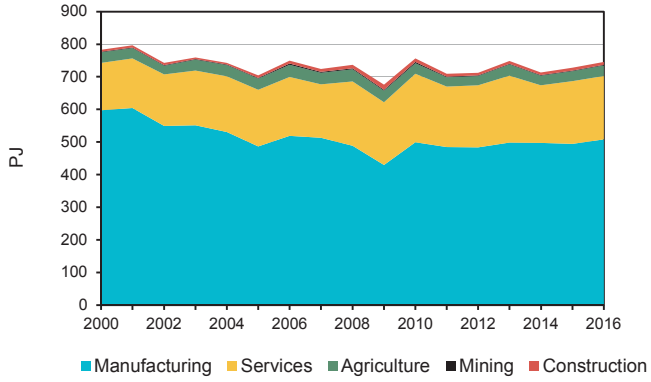
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

BELGIUM

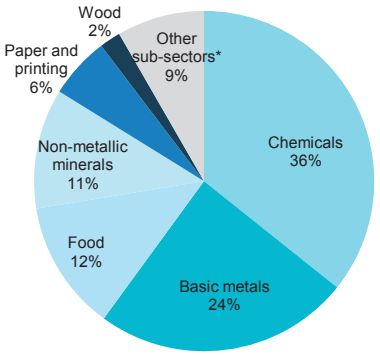
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	597	146	41	372	52	250
2016	508	195	43	466	62	316

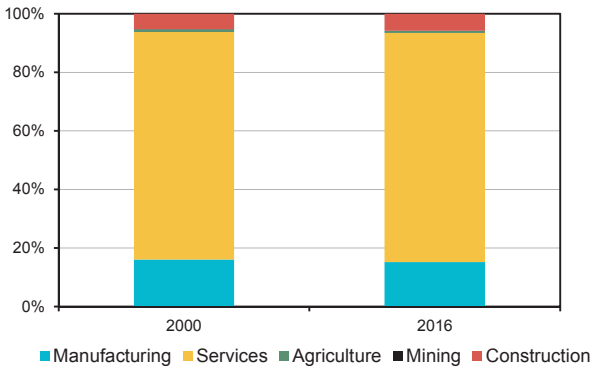
Industry and services energy consumption



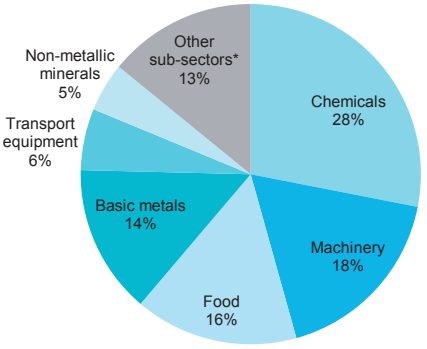
Manufacturing energy consumption by sub-sector, 2016



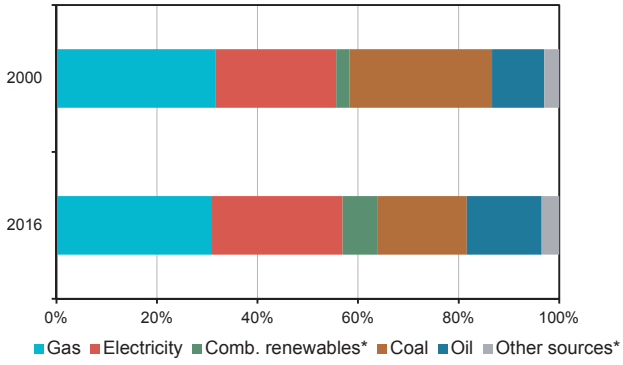
Value added** by sector



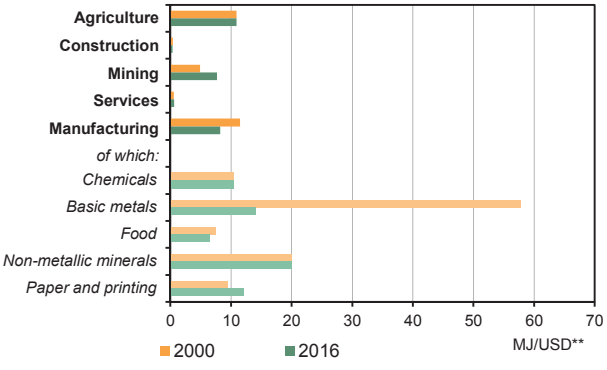
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



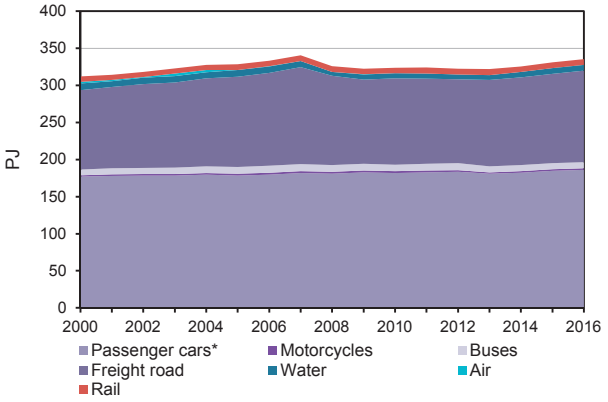
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

BELGIUM

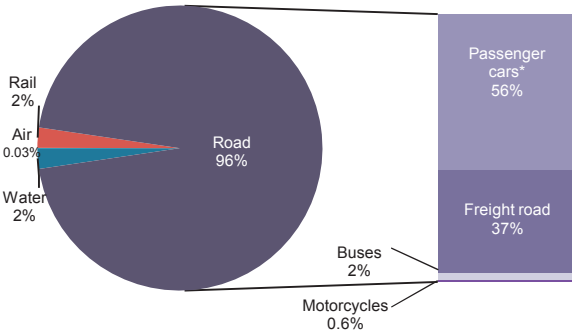
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	193	119	125	62	1.4	3.0
2016	202	133	136	71	1.4	2.7

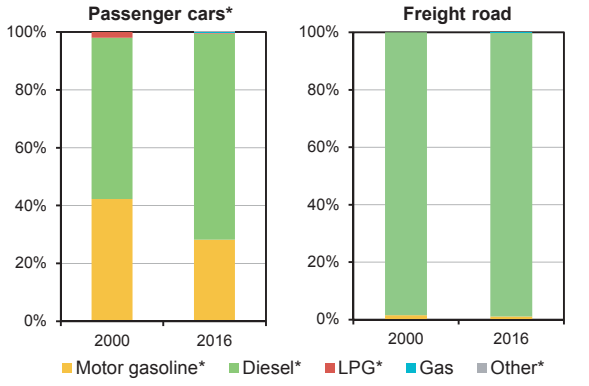
Transport energy consumption by mode/vehicle type



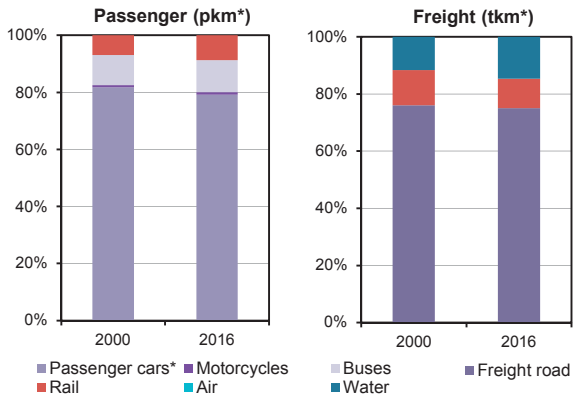
Transport energy consumption by mode/vehicle type, 2016



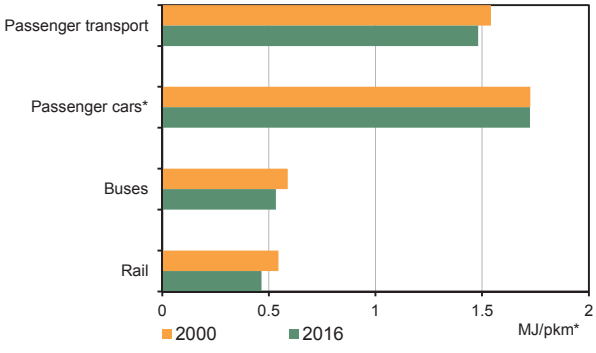
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



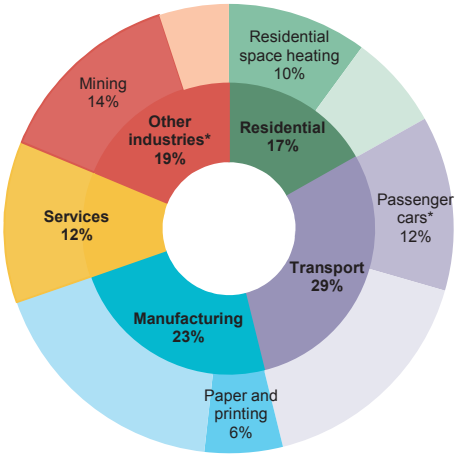
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

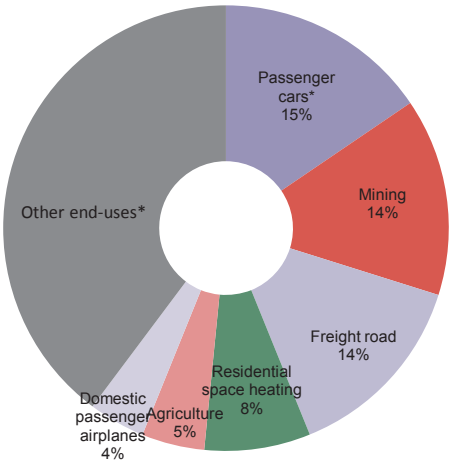
CANADA

Cross-sectoral overview

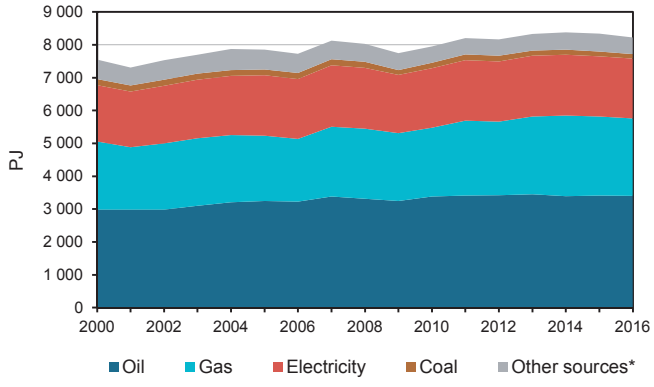
Largest end-uses by sector, 2016



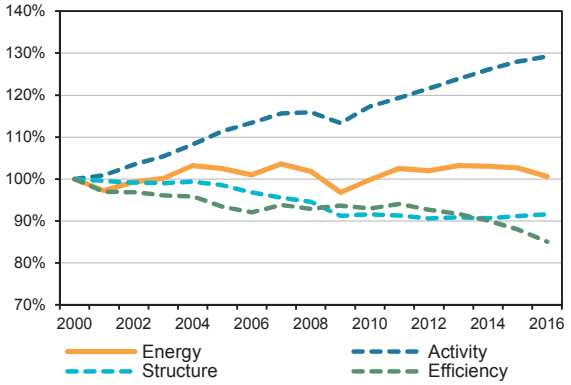
Top six CO_2 emitting end-uses, 2016**



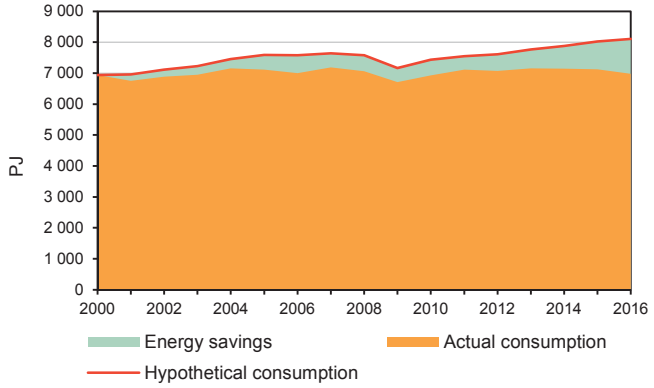
Final energy consumption by source



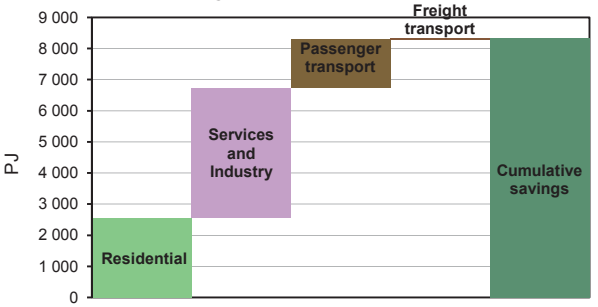
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



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**Includes emissions reallocated from electricity and heat generation.

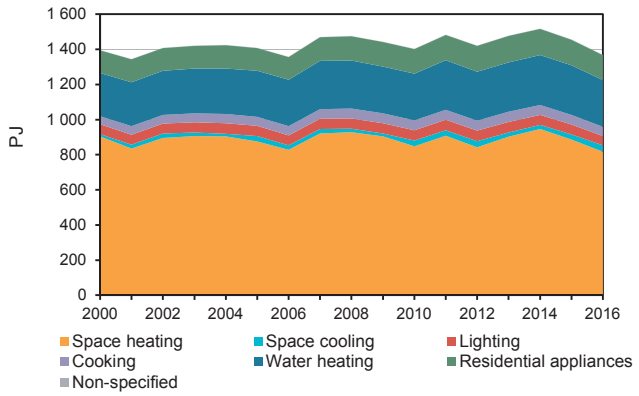
***These figures display results from the IEA decomposition analysis and cover approximately 90% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

CANADA

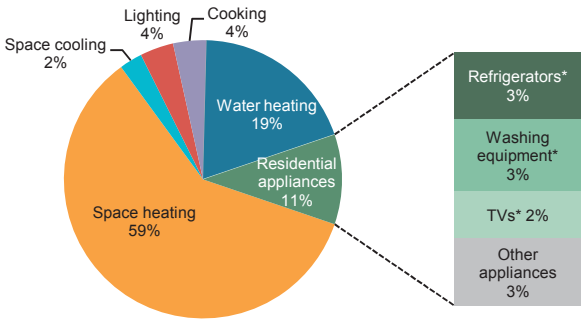
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	1 394	61	31	45	129	2.6
2016	1 367	54	36	38	142	2.5

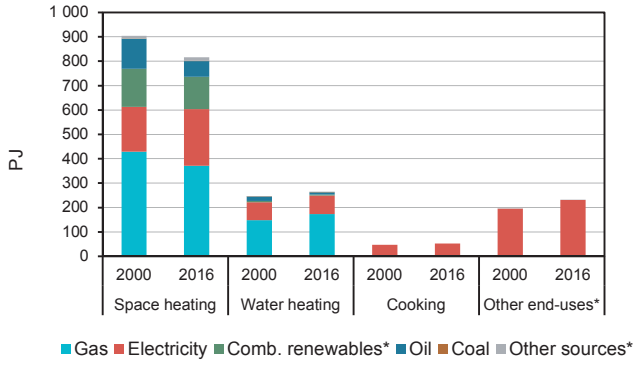
Residential energy consumption by end-use



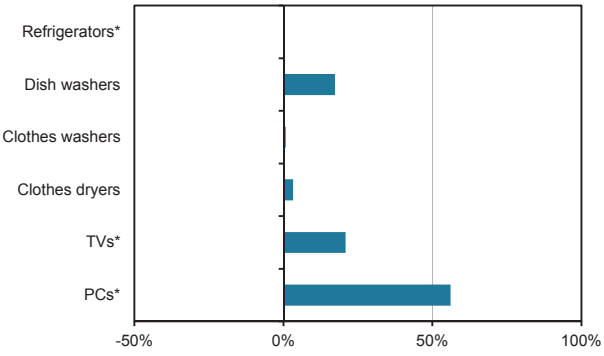
Residential energy consumption by end-use, 2016



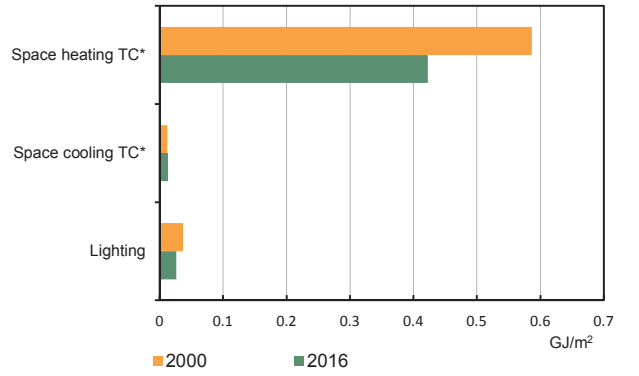
Residential energy consumption by source



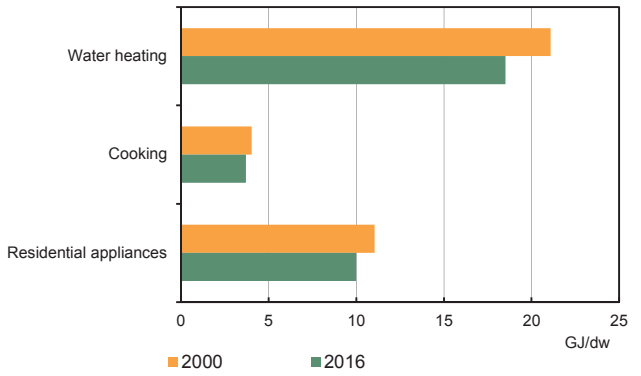
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



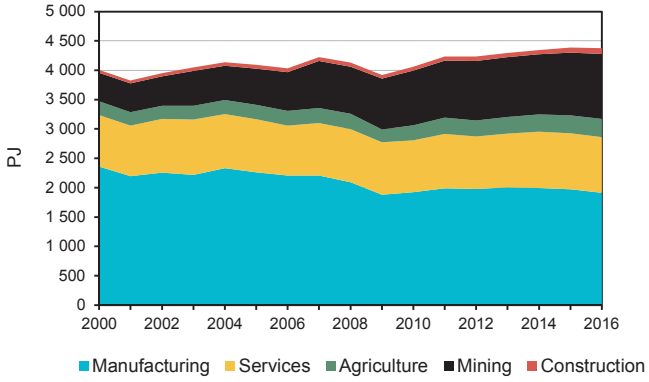
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

CANADA

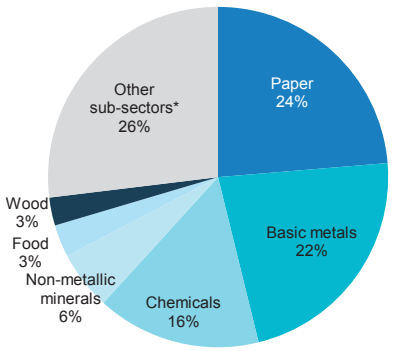
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	2 358	869	771	1 133	150	595
2016	1 911	935	1 517	1 538	134	864

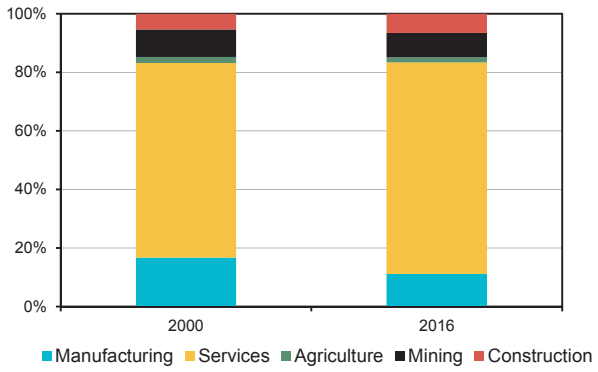
Industry and services energy consumption



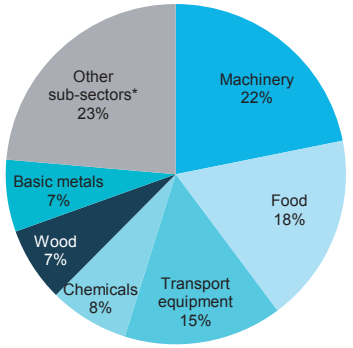
Manufacturing energy consumption by sub-sector, 2016



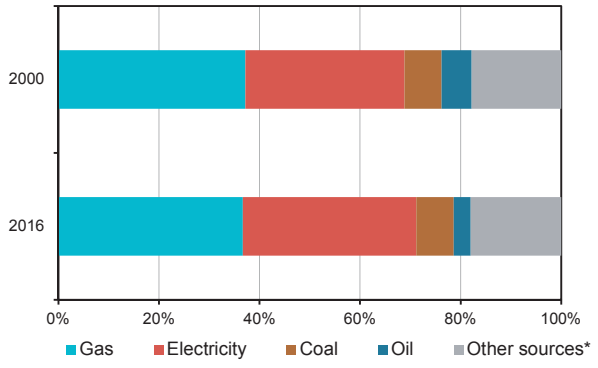
Value added** by sector



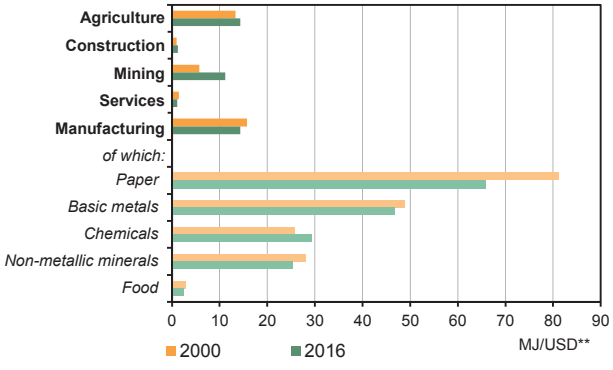
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustibles renewables and wastes; other sources includes combustible renewables and waste, heat and other energy sources.

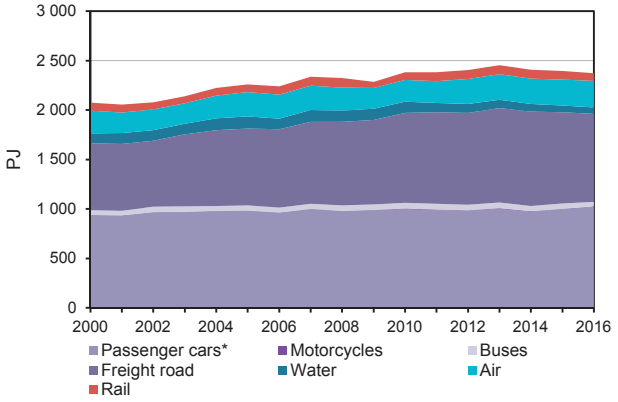
**GDP and VA are at the price levels and PPPs of year 2007; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

CANADA

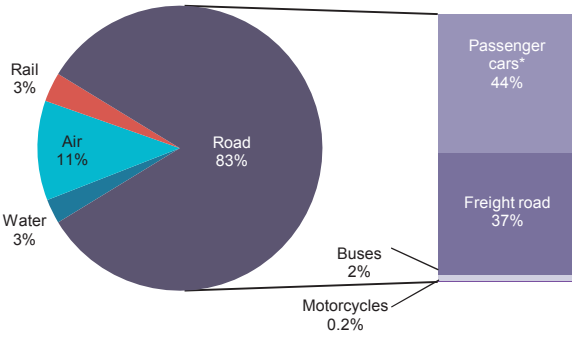
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	1 211	863	610	775	1.6	3.1
2016	1 338	1 037	791	972	1.6	2.9

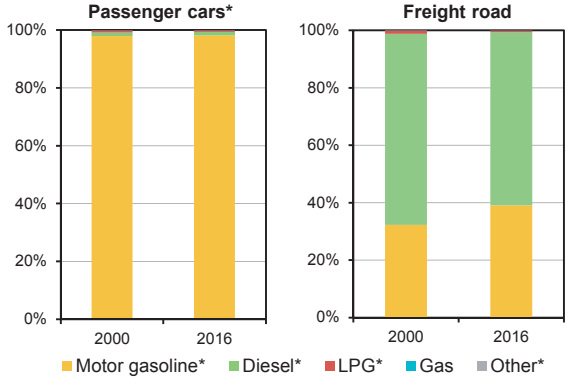
Transport energy consumption by mode/vehicle type



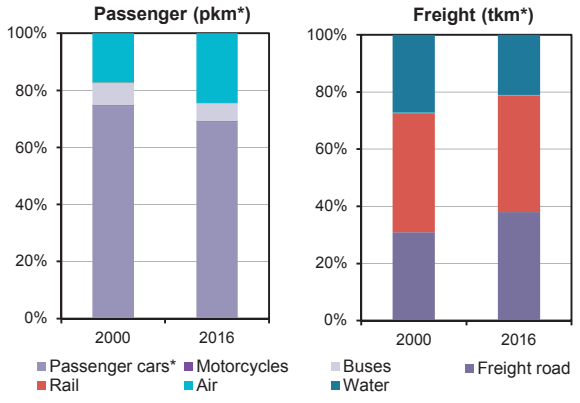
Transport energy consumption by mode/vehicle type, 2016



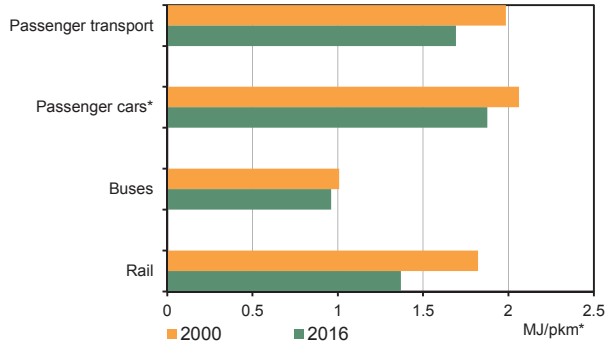
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



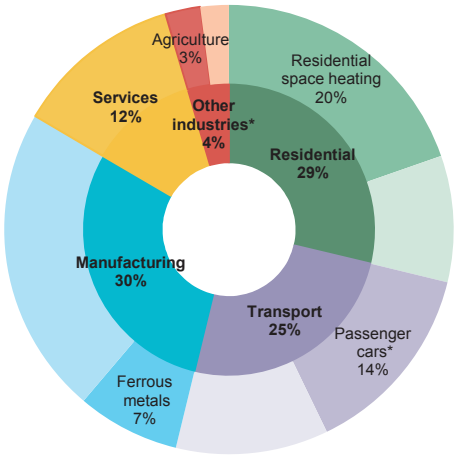
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

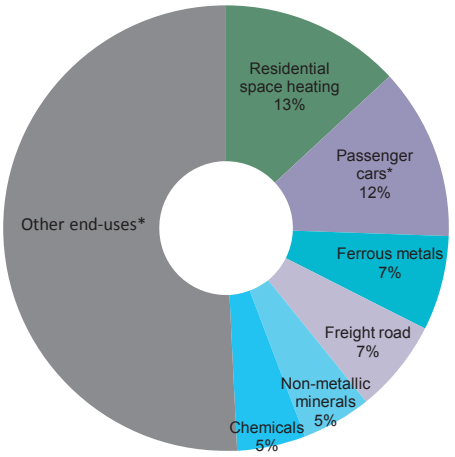
CZECH REPUBLIC

Cross-sectoral overview

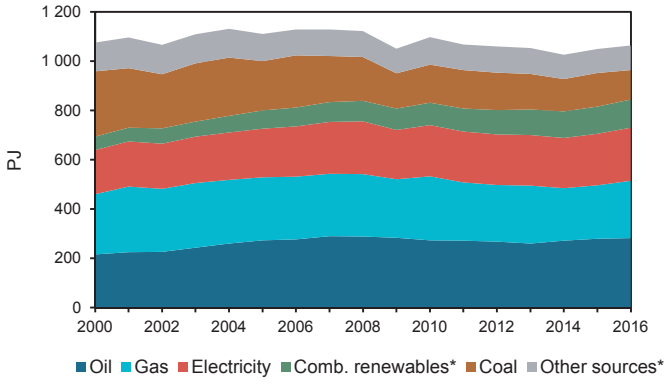
Largest end-uses by sector, 2016



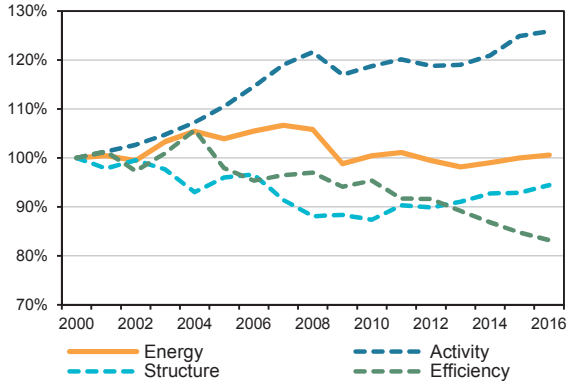
Top six CO_2 emitting end-uses, 2016**



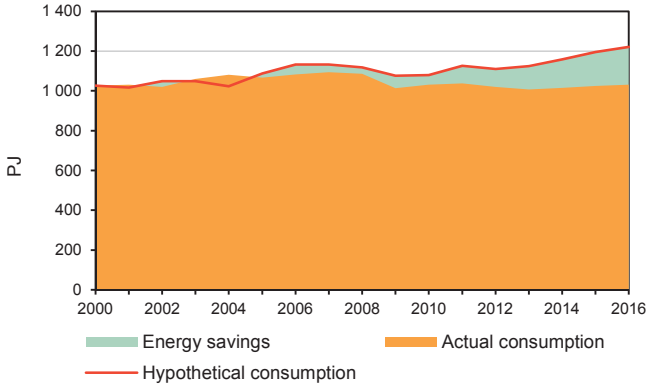
Final energy consumption by source



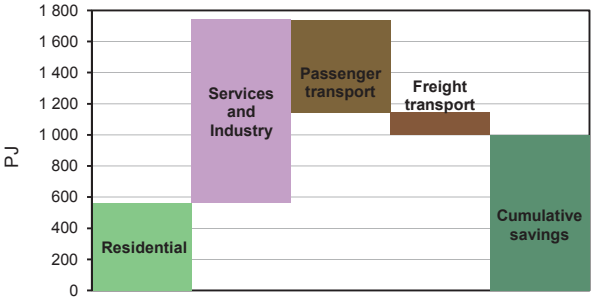
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

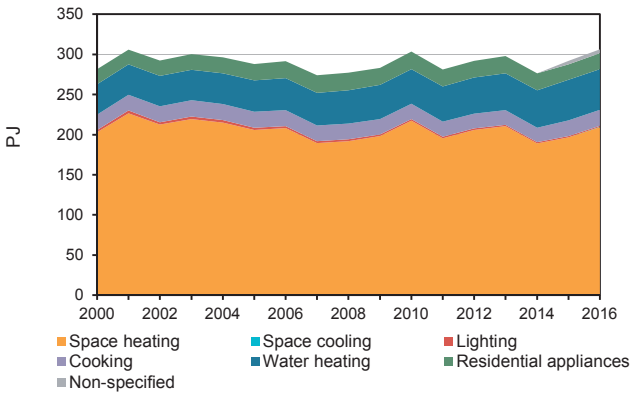
***These figures display results from the IEA decomposition analysis and cover approximately 98% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

CZECH REPUBLIC

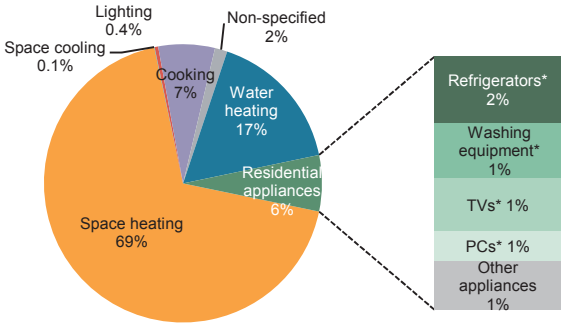
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	282	59	10	27	73	2.7
2016	306	48	11	29	77	2.5

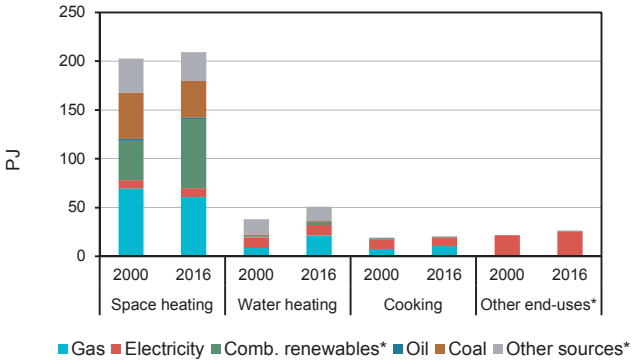
Residential energy consumption by end-use



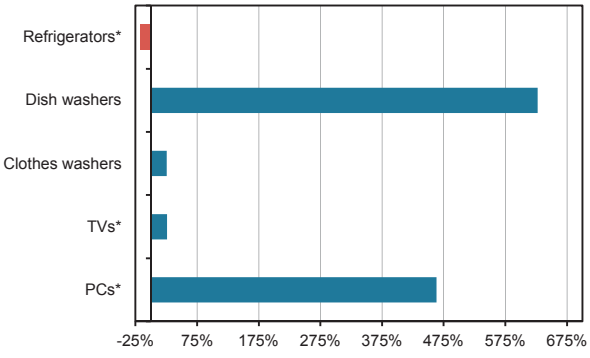
Residential energy consumption by end-use, 2016



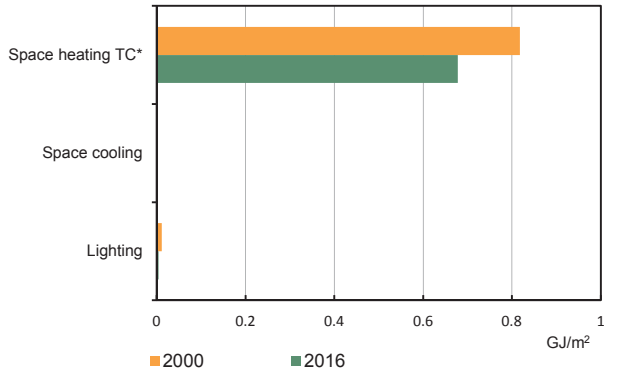
Residential energy consumption by source



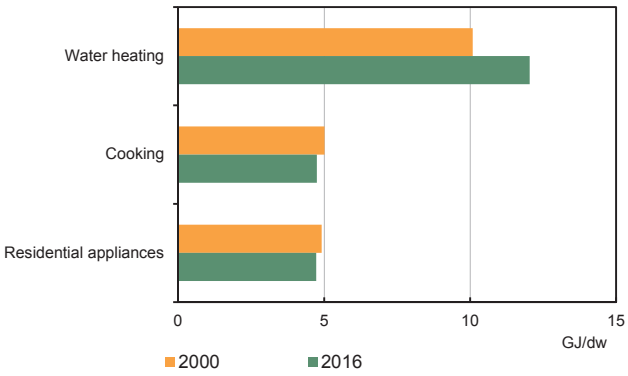
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



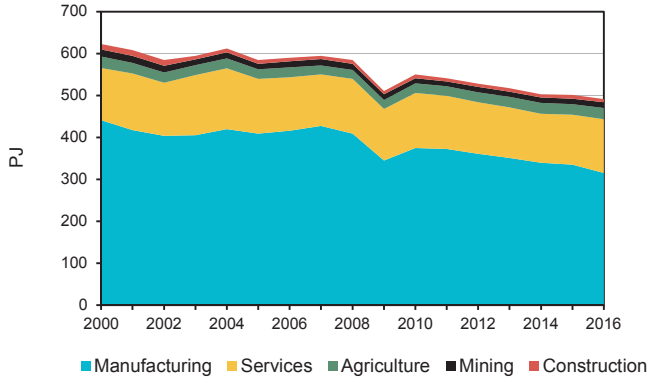
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

CZECH REPUBLIC

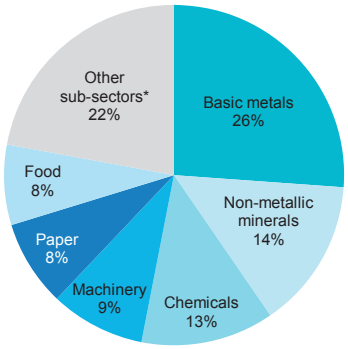
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	441	124	57	212	31	156
2016	315	128	49	324	73	210

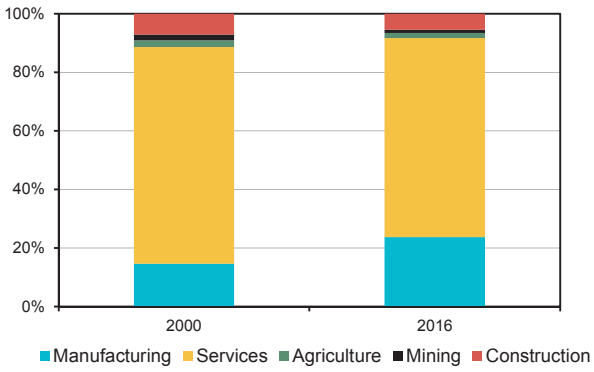
Industry and services energy consumption



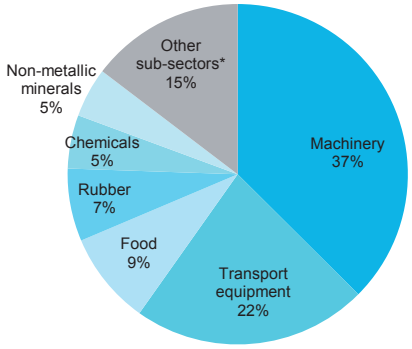
Manufacturing energy consumption by sub-sector, 2016



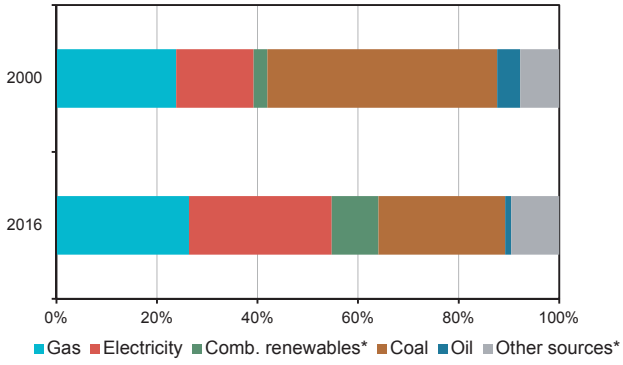
Value added** by sector



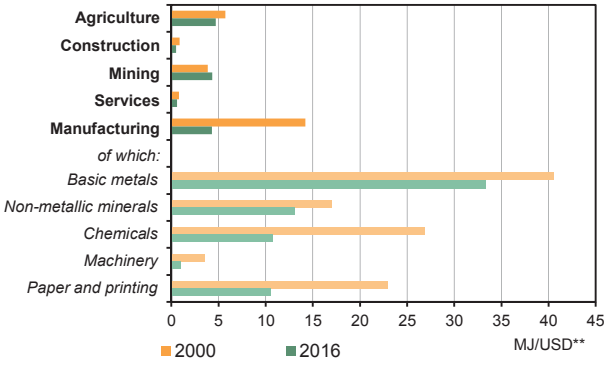
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



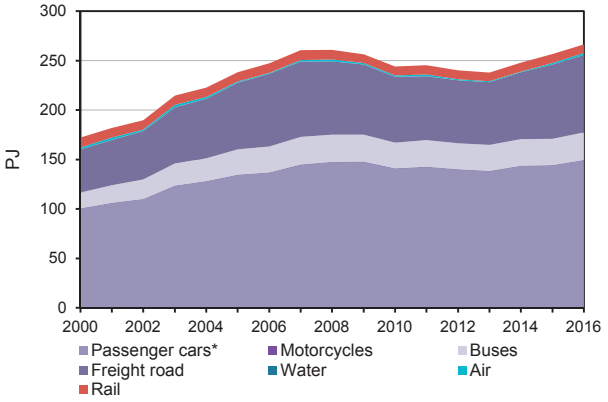
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

CZECH REPUBLIC

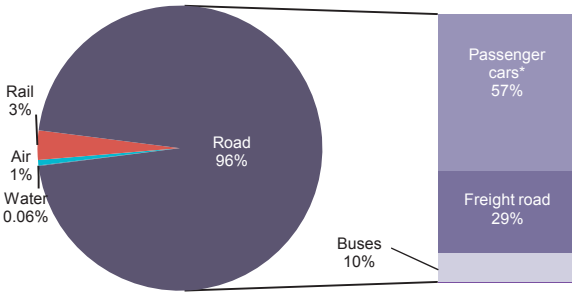
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	122	50	101	57	2.0	4.8
2016	183	84	119	67	1.6	NA

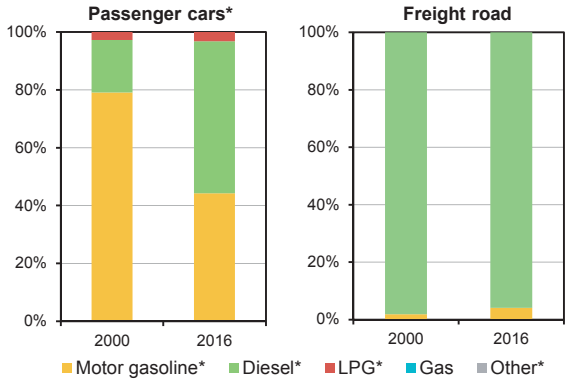
Transport energy consumption by mode/vehicle type



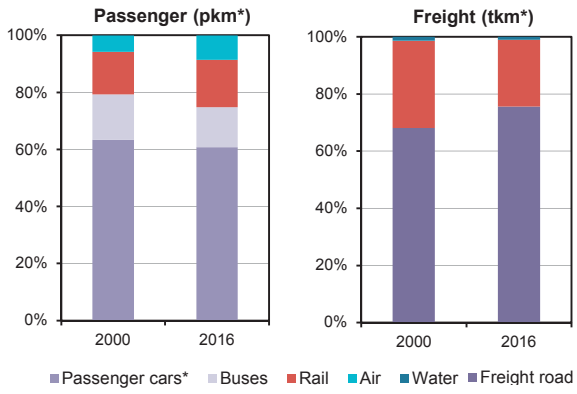
Transport energy consumption by mode/vehicle type, 2016



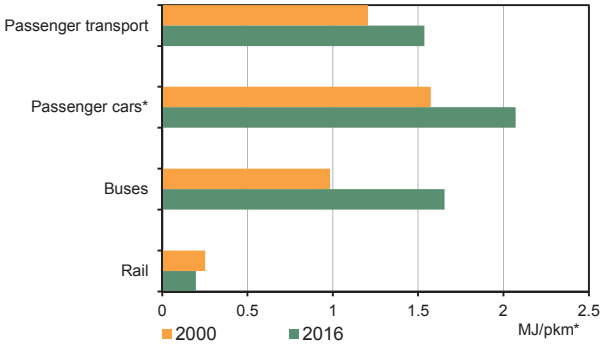
Energy consumption in road transport by source



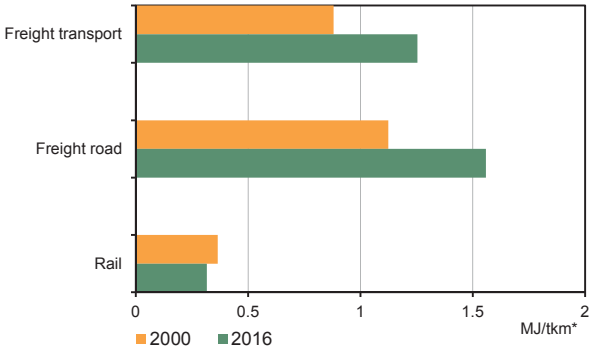
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport

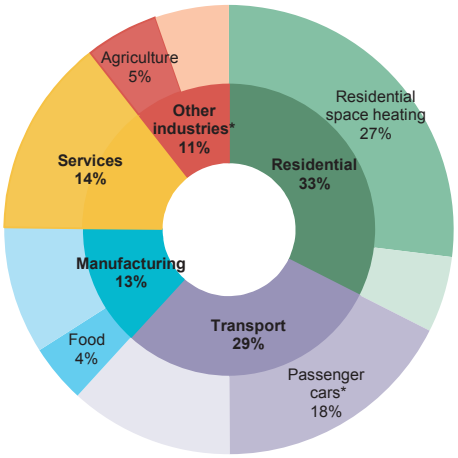


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

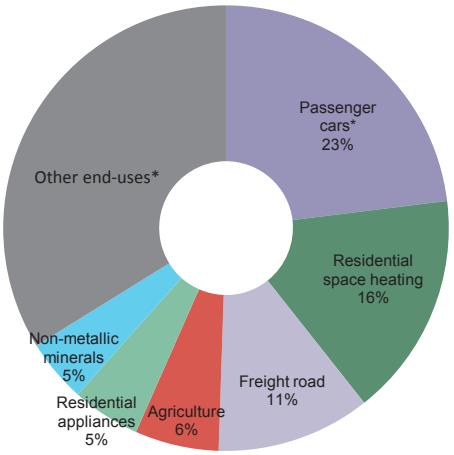
DENMARK

Cross-sectoral overview

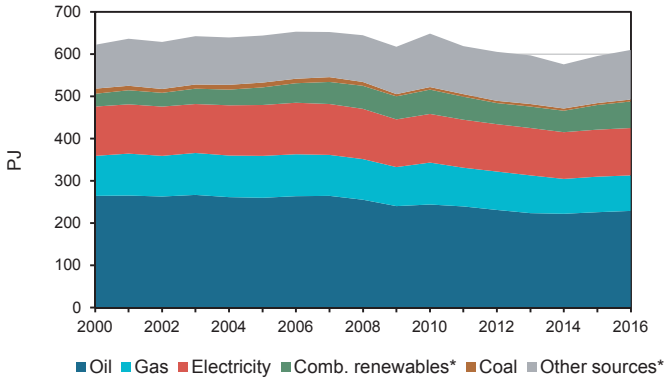
Largest end-uses by sector, 2016



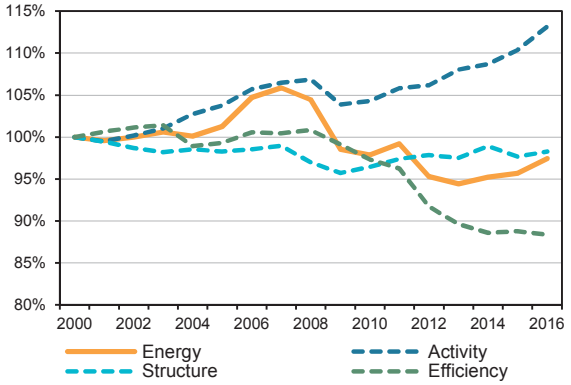
Top six CO_2 emitting end-uses, 2016**



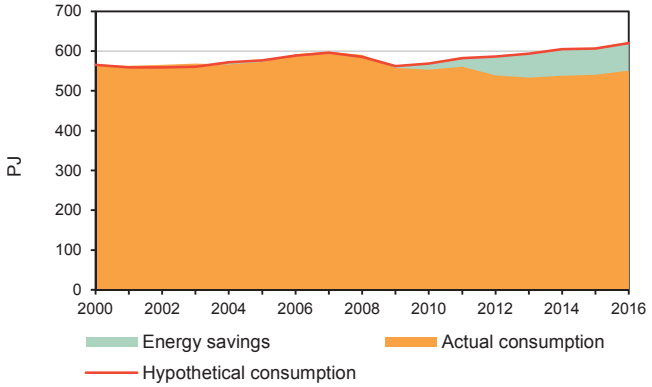
Final energy consumption by source



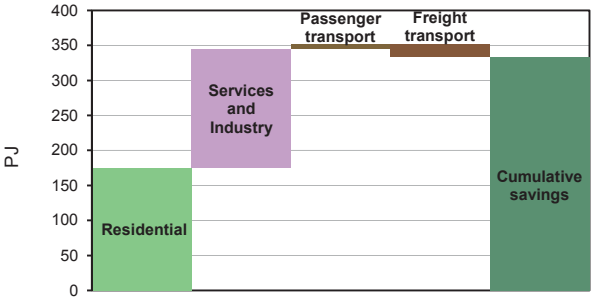
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



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**Includes emissions reallocated from electricity and heat generation.

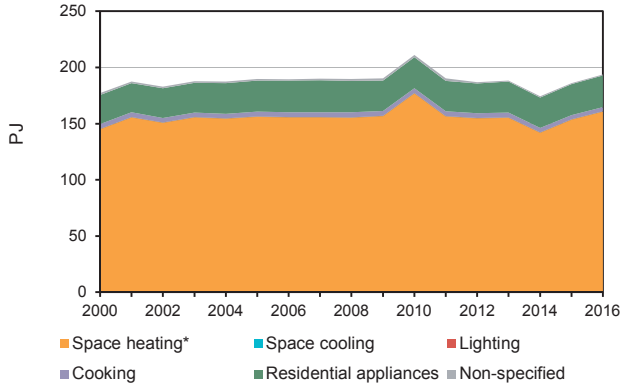
***These figures display results from the IEA decomposition analysis and cover approximately 92% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

DENMARK

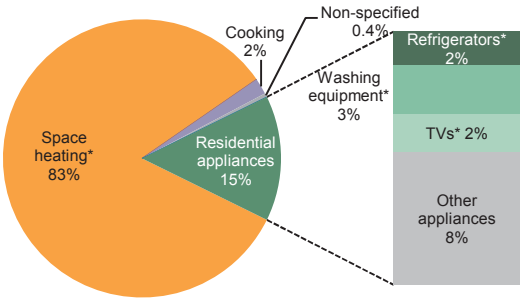
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	177	40	5	33	109	2.1
2016	194	22	6	34	119	2.1

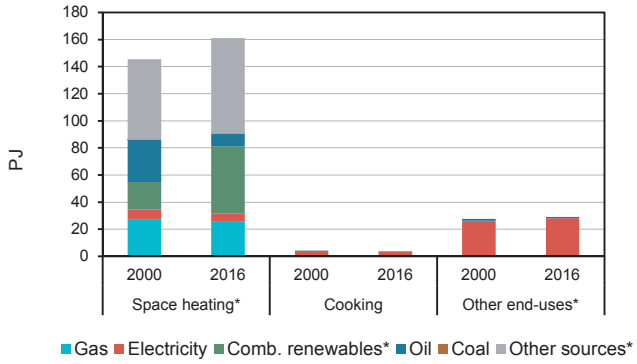
Residential energy consumption by end-use



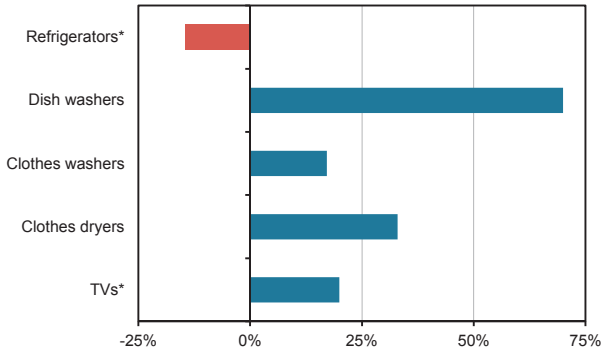
Residential energy consumption by end-use, 2016



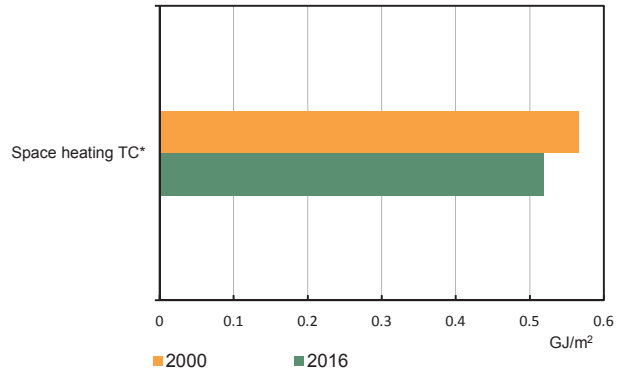
Residential energy consumption by source



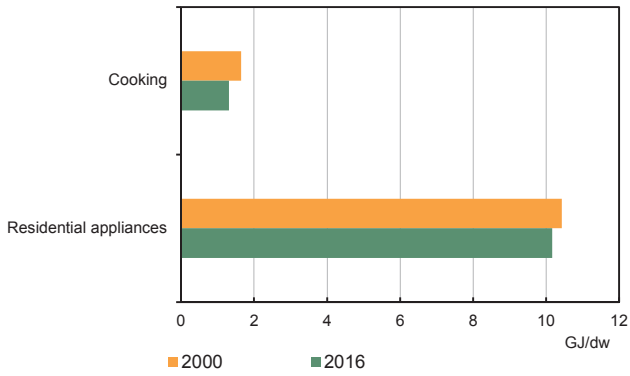
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



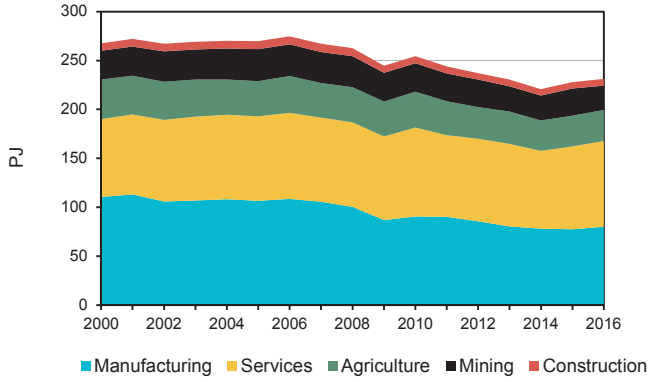
*Share of fossil fuels includes only the direct use of oil, gas and coal; space heating includes water heating; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

DENMARK

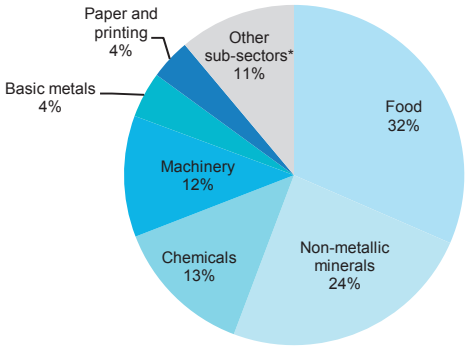
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	110	80	77	221	28	136
2016	80	85	63	258	32	169

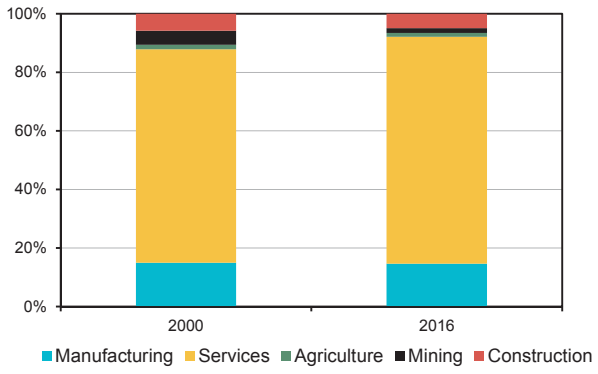
Industry and services energy consumption



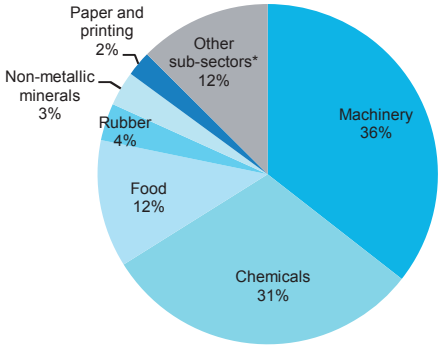
Manufacturing energy consumption by sub-sector, 2016



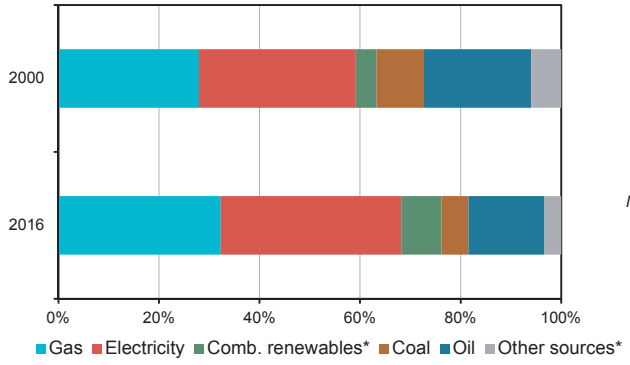
Value added** by sector



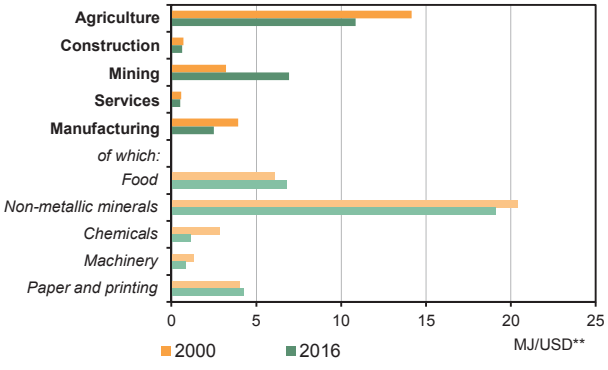
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



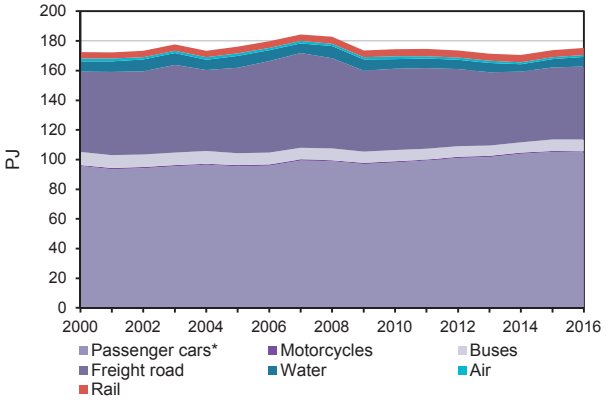
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

DENMARK

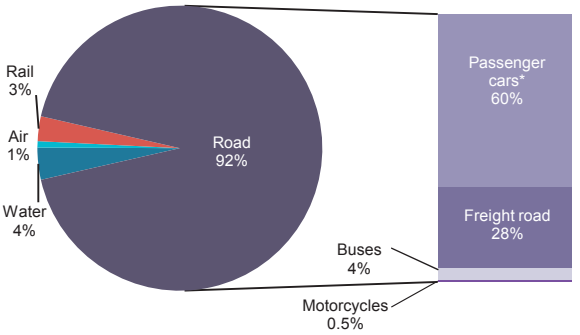
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	110	63	64	26	1.5	3.2
2016	118	57	73	27	1.4	3.3

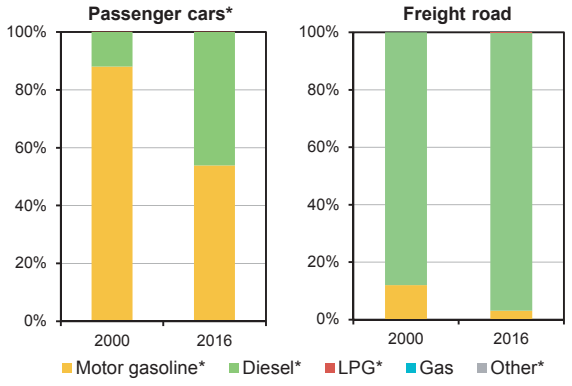
Transport energy consumption by mode/vehicle type



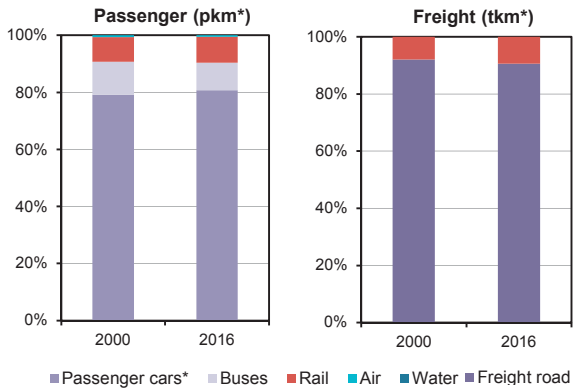
Transport energy consumption by mode/vehicle type, 2016



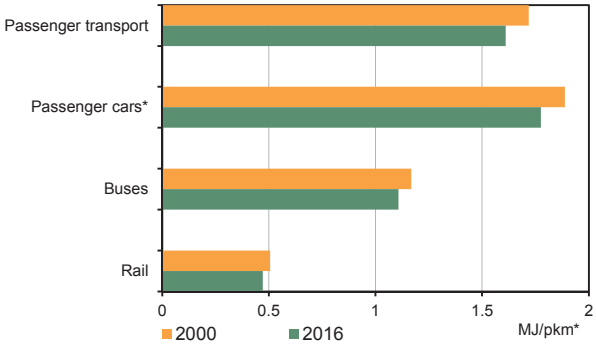
Energy consumption in road transport by source



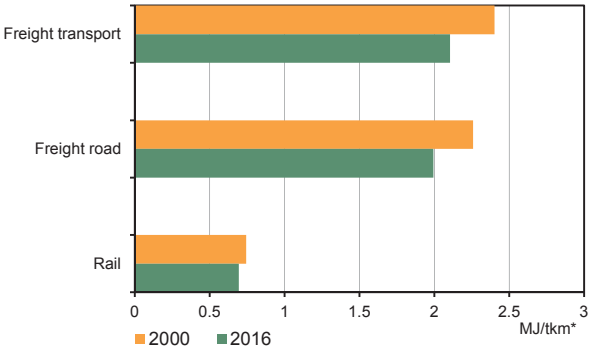
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport

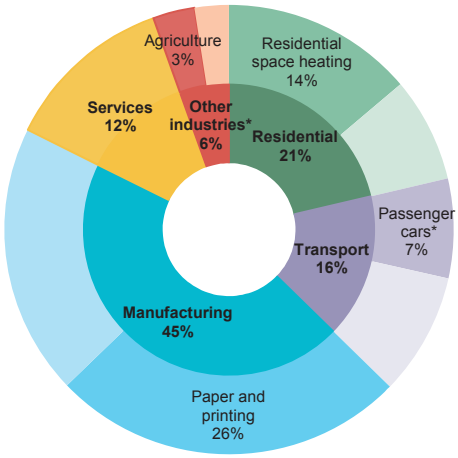


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

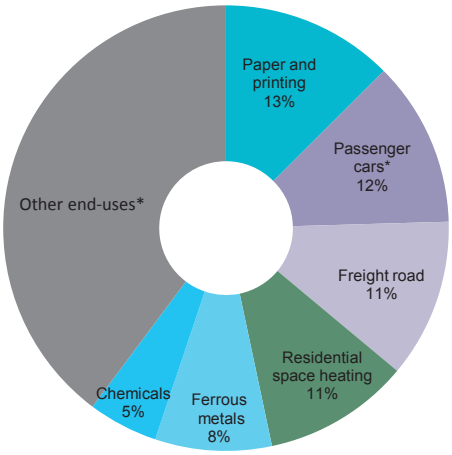
FINLAND

Cross-sectoral overview

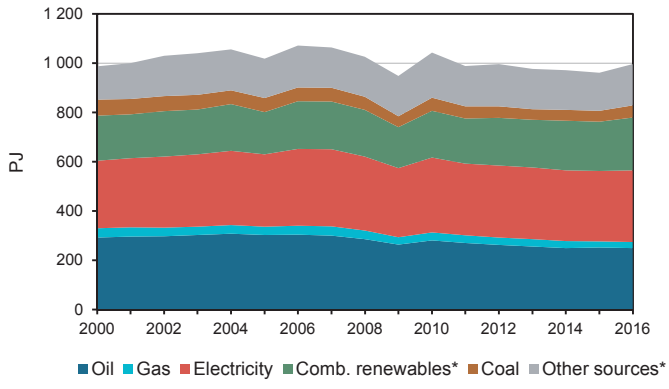
Largest end-uses by sector, 2016



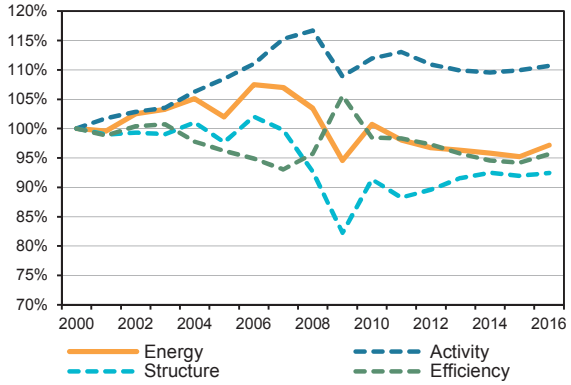
Top six CO_2 emitting end-uses, 2016**



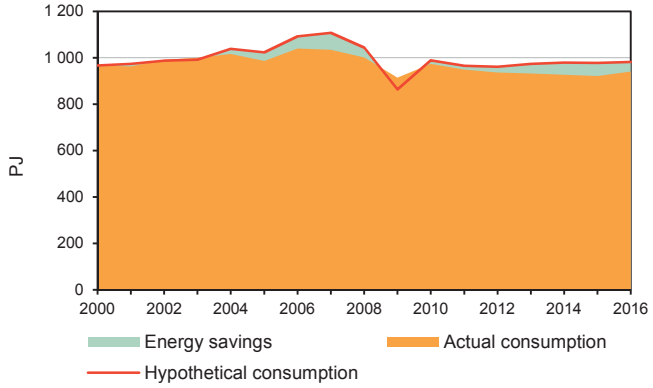
Final energy consumption by source



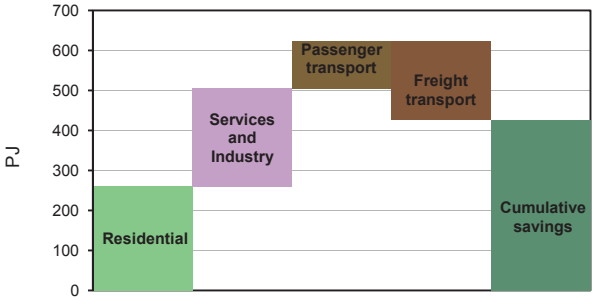
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

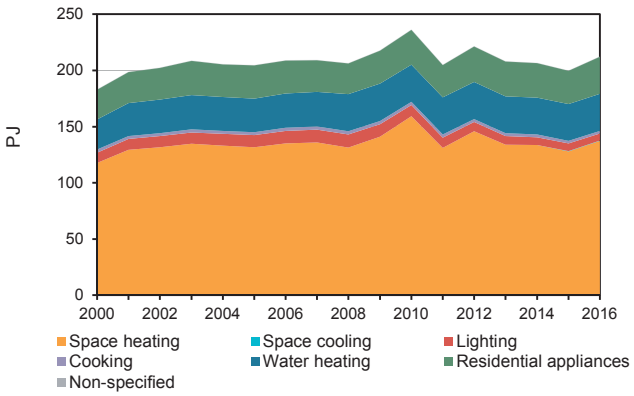
***These figures display results from the IEA decomposition analysis and cover approximately 97% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

FINLAND

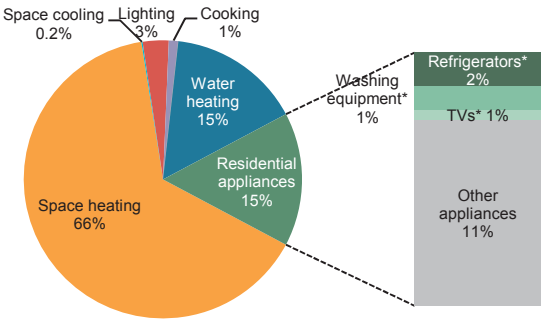
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	183	22	5	35	96	2.1
2016	212	9	5	39	104	1.9

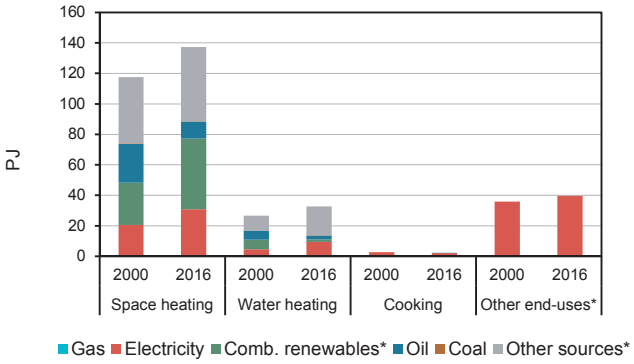
Residential energy consumption by end-use



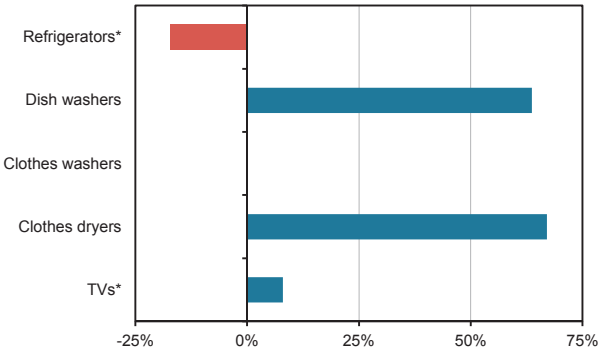
Residential energy consumption by end-use, 2016



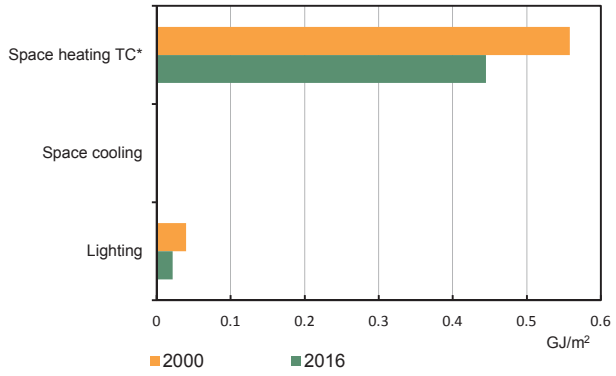
Residential energy consumption by source



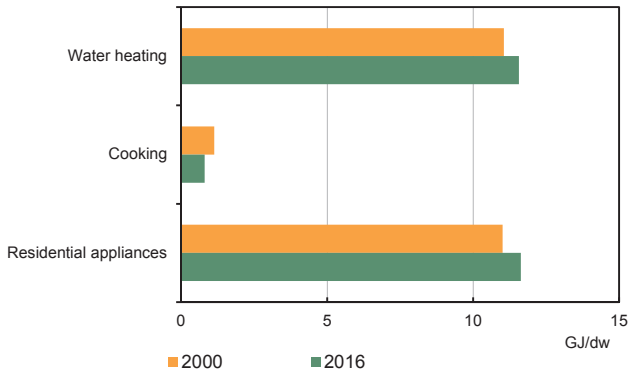
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



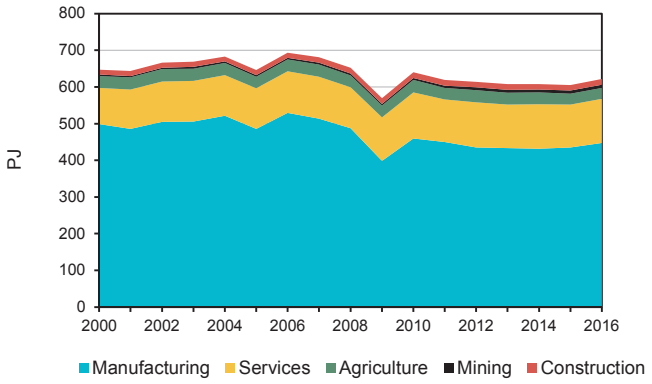
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

FINLAND

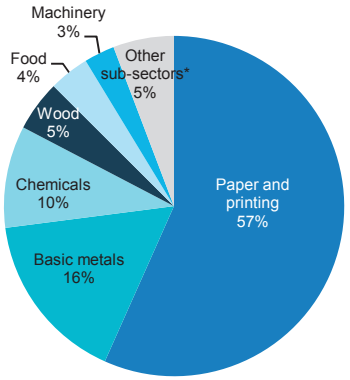
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	499	99	50	176	30	107
2016	448	121	54	212	31	128

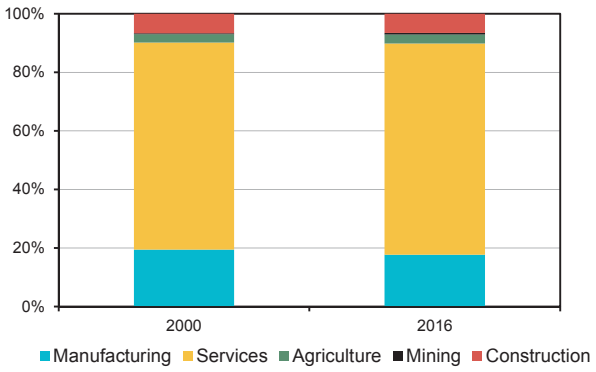
Industry and services energy consumption



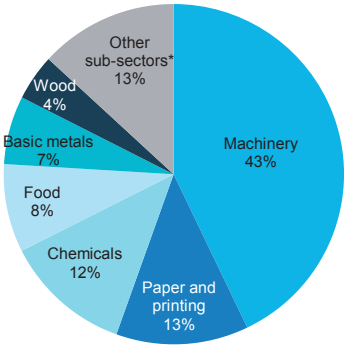
Manufacturing energy consumption by sub-sector, 2016



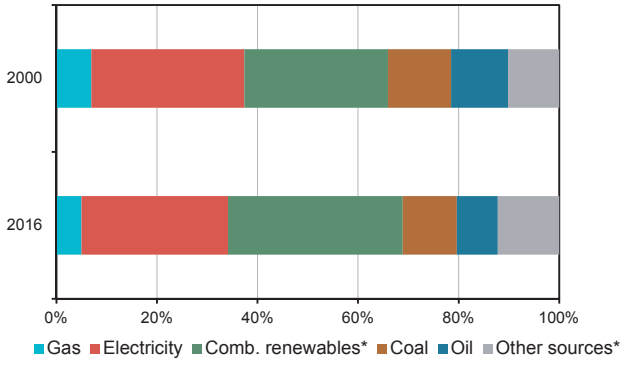
Value added** by sector



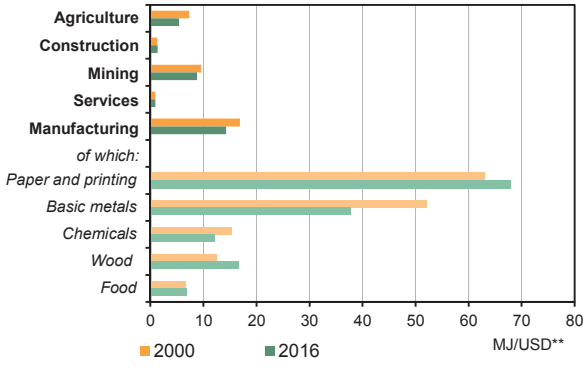
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



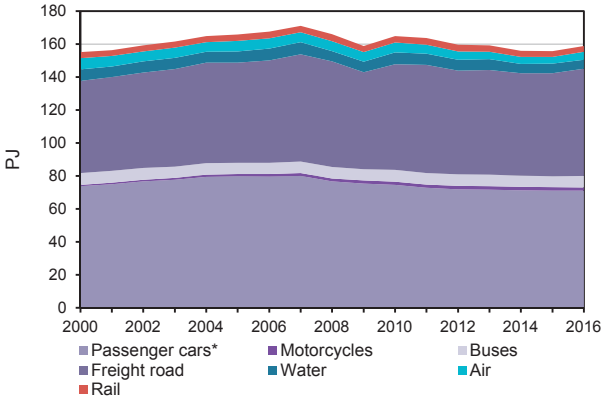
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

FINLAND

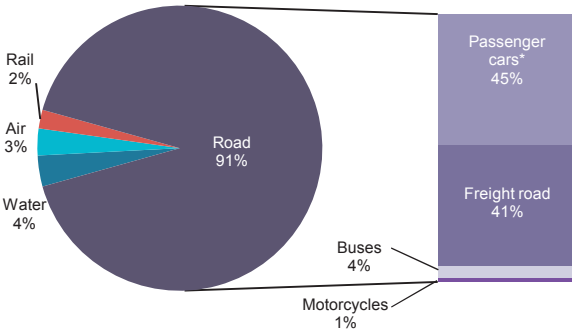
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	92	63	69	41	1.4	3.9
2016	89	70	70	37	1.4	2.6

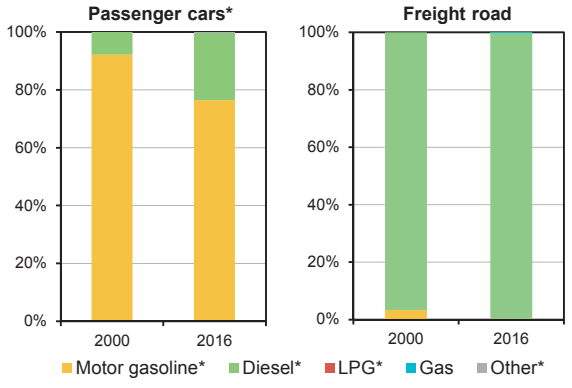
Transport energy consumption by mode/vehicle type



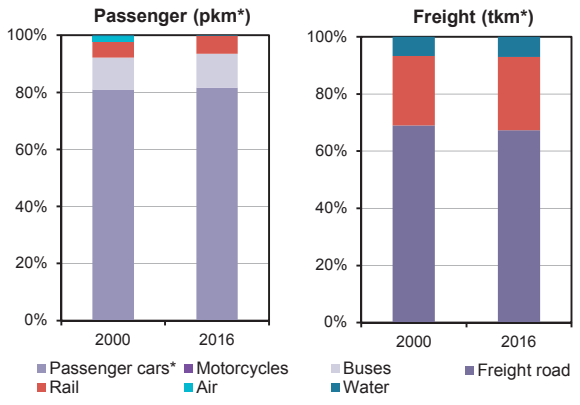
Transport energy consumption by mode/vehicle type, 2016



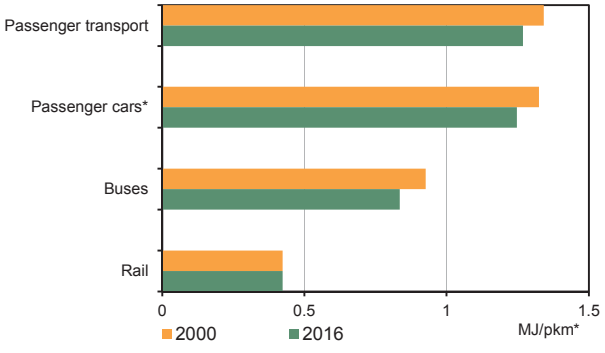
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



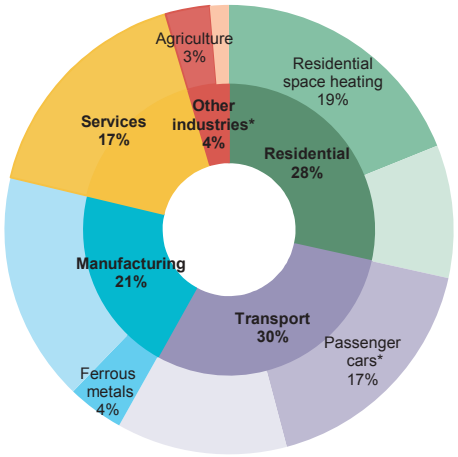
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

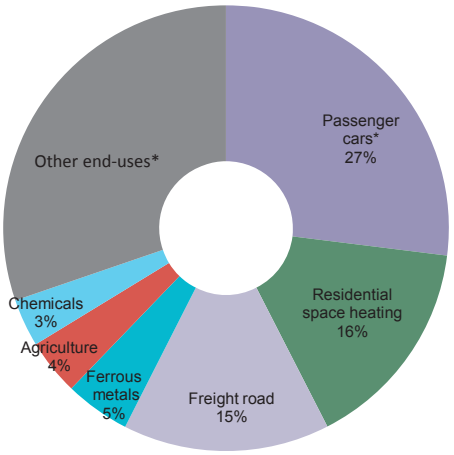
FRANCE

Cross-sectoral overview

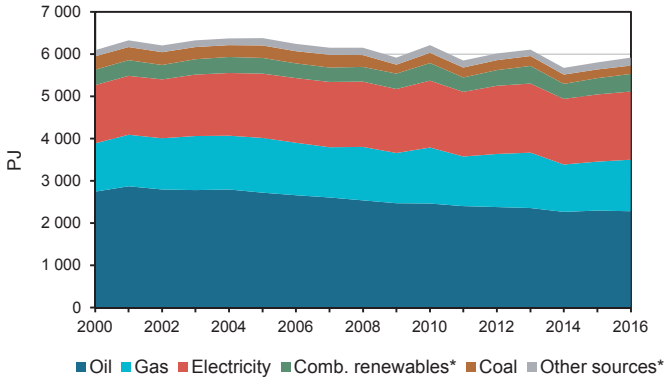
Largest end-uses by sector, 2016



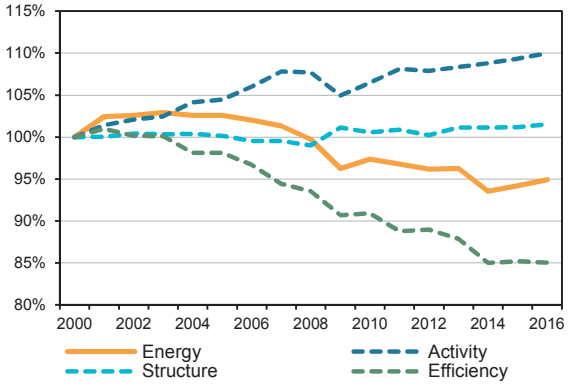
Top six CO_2 emitting end-uses, 2016**



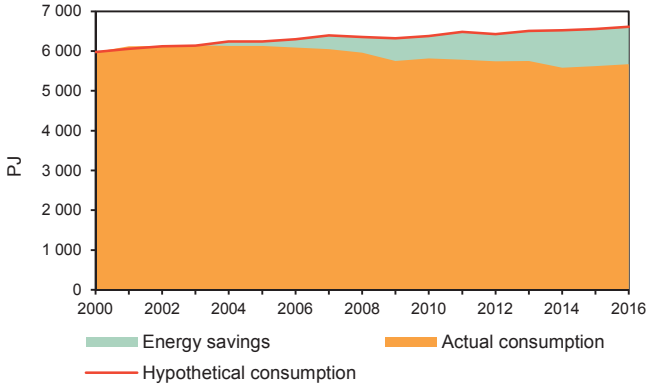
Final energy consumption by source



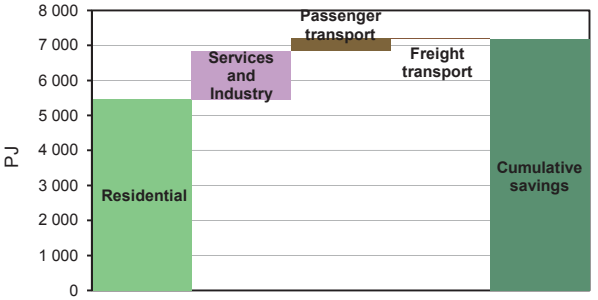
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

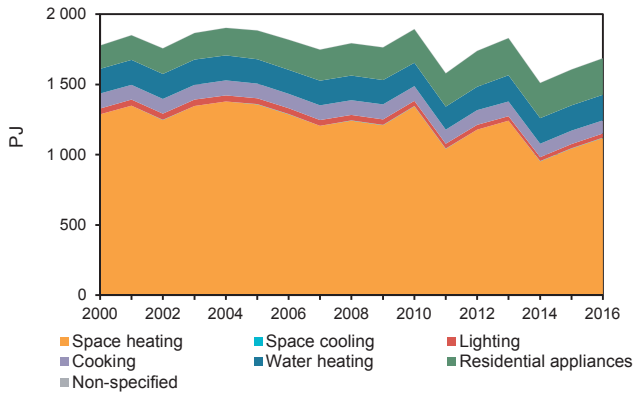
***These figures display results from the IEA decomposition analysis and cover approximately 98% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

FRANCE

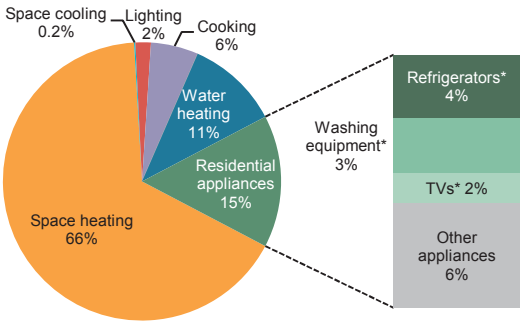
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	1 777	64	59	30	89	2.4
2016	1 685	56	65	26	93	2.3

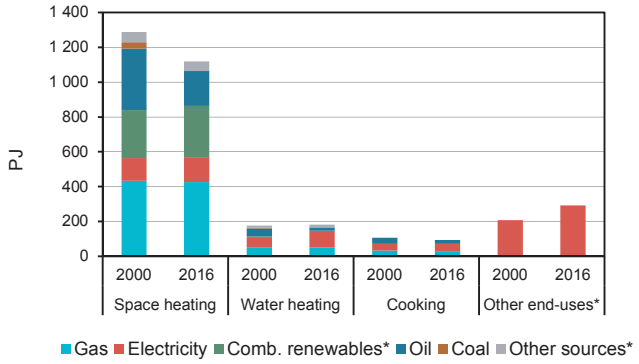
Residential energy consumption by end-use



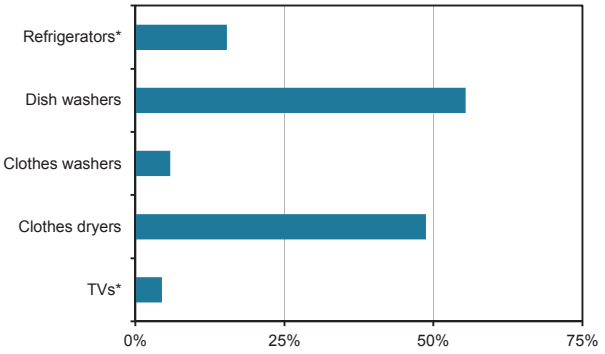
Residential energy consumption by end-use, 2016



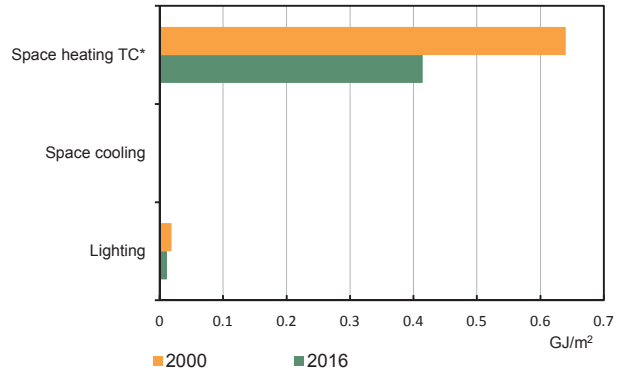
Residential energy consumption by source



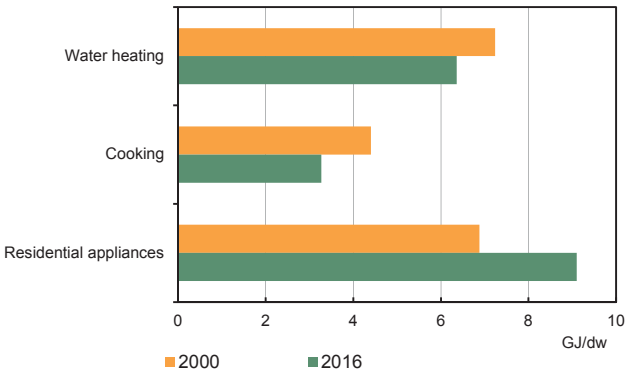
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



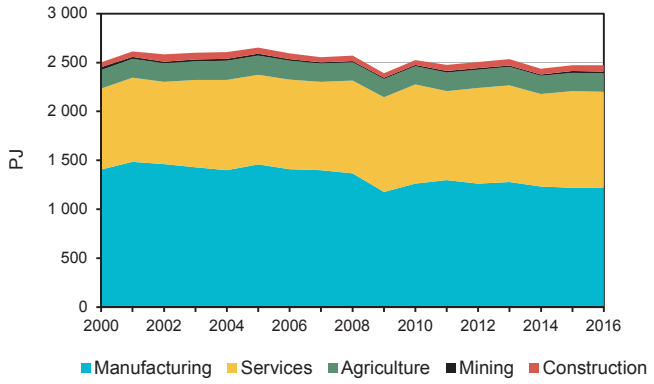
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

FRANCE

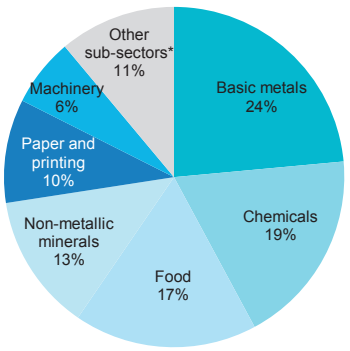
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	1 405	602	268	2 077	221	1 454
2016	1 220	680	270	2 488	255	1 784

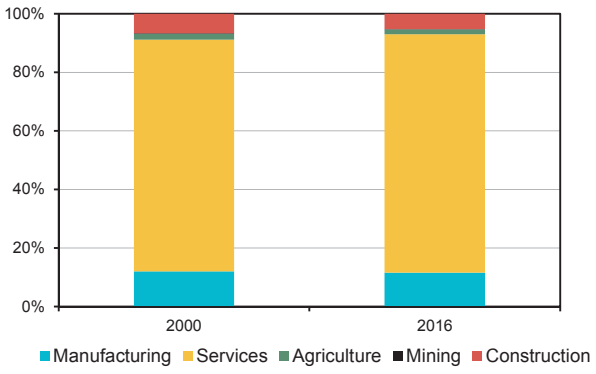
Industry and services energy consumption



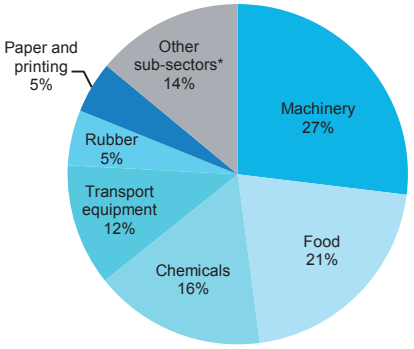
Manufacturing energy consumption by sub-sector, 2016



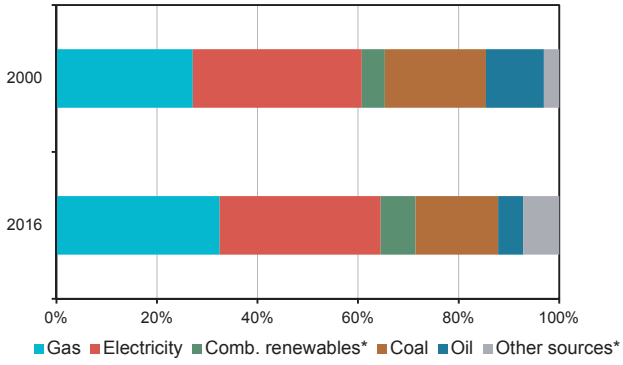
Value added** by sector



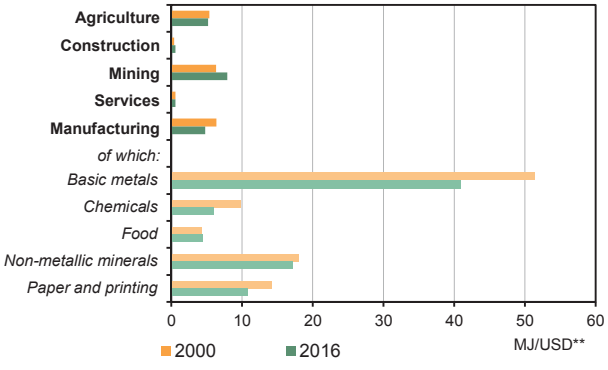
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



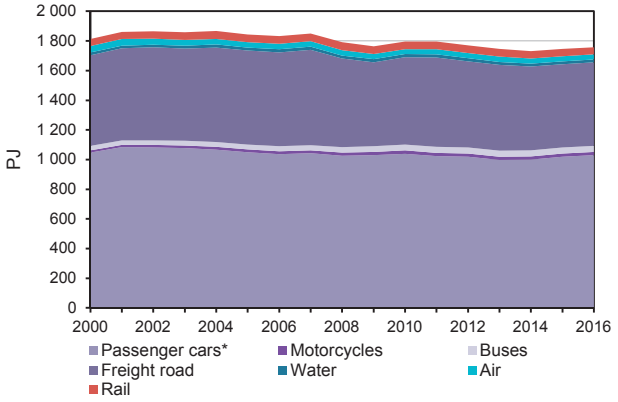
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

FRANCE

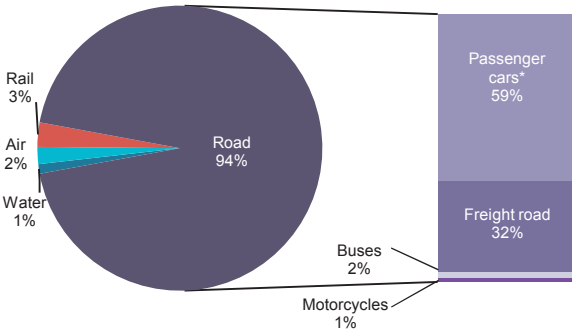
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	1 170	644	786	268	1.7	2.0
2016	1 172	585	875	214	1.6	1.5

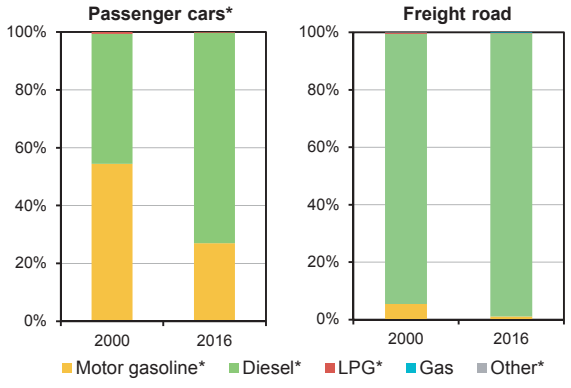
Transport energy consumption by mode/vehicle type



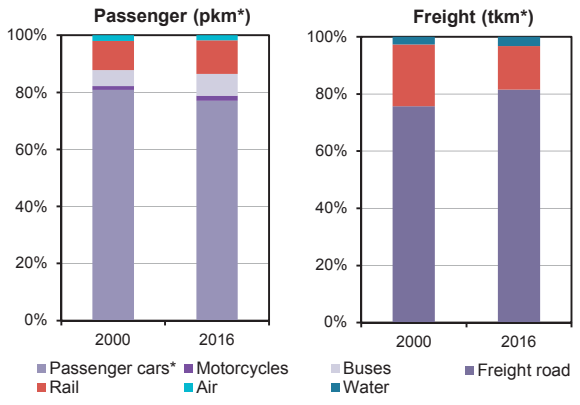
Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport

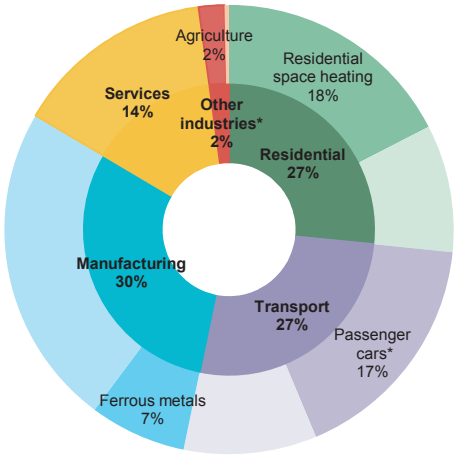
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

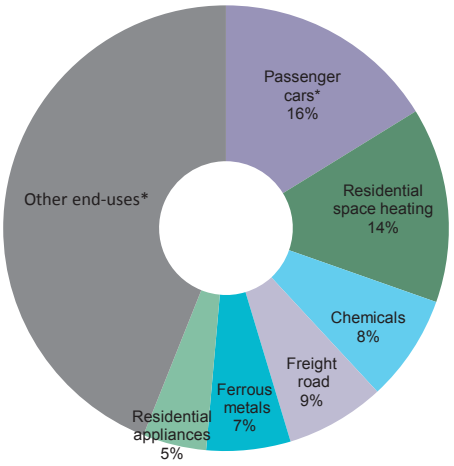
GERMANY

Cross-sectoral overview

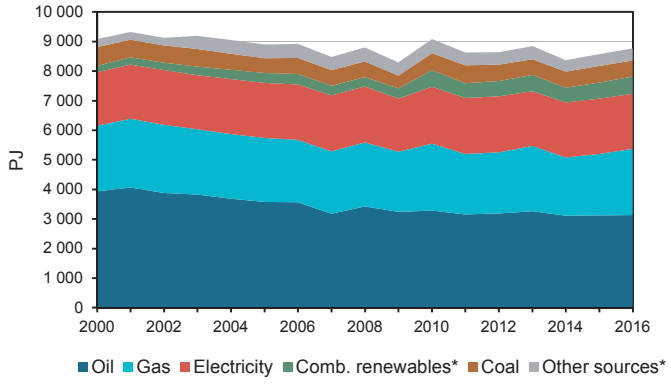
Largest end-uses by sector, 2016



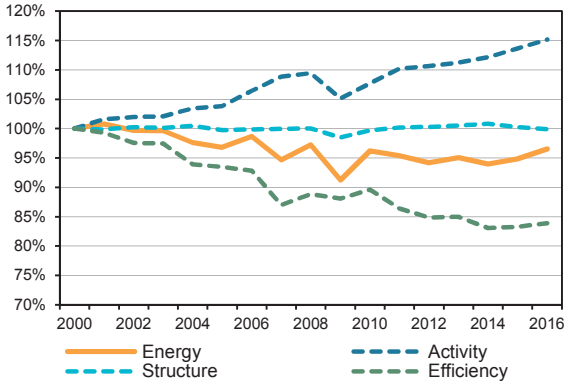
Top six CO_2 emitting end-uses, 2016**



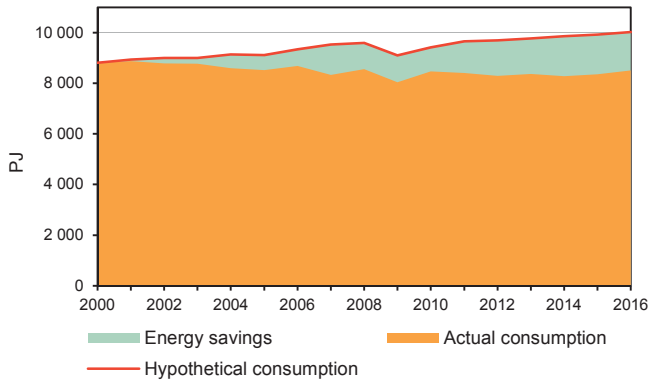
Final energy consumption by source



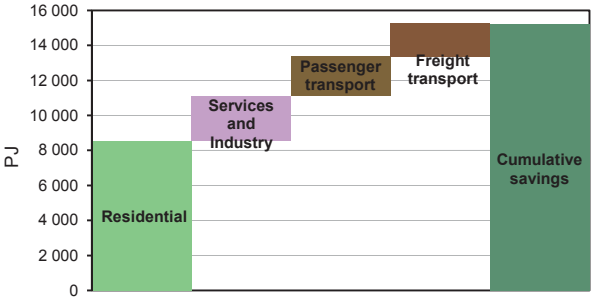
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

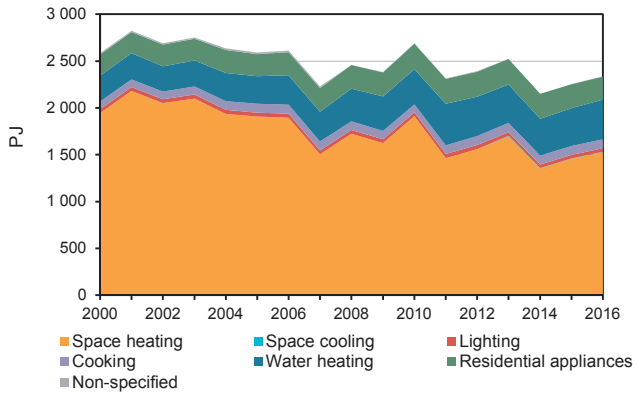
***These figures display results from the IEA decomposition analysis and cover approximately 98% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

GERMANY

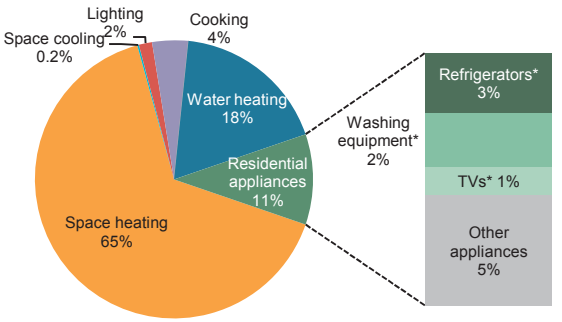
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	2 585	82	81	32	92	2.3
2016	2 333	81	83	28	100	2.2

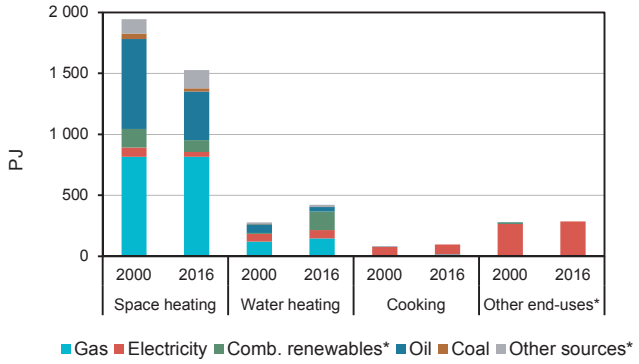
Residential energy consumption by end-use



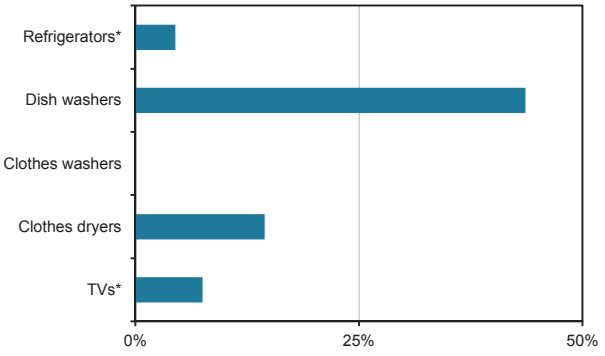
Residential energy consumption by end-use, 2016



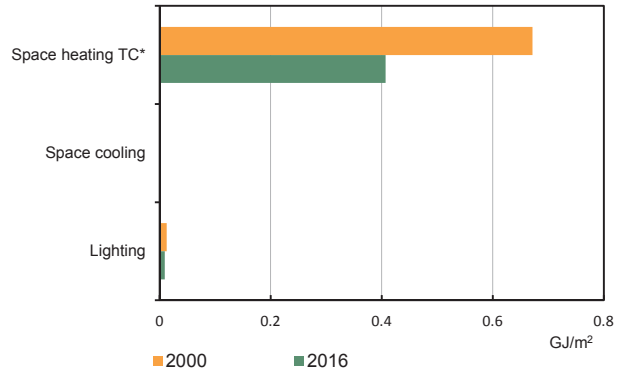
Residential energy consumption by source



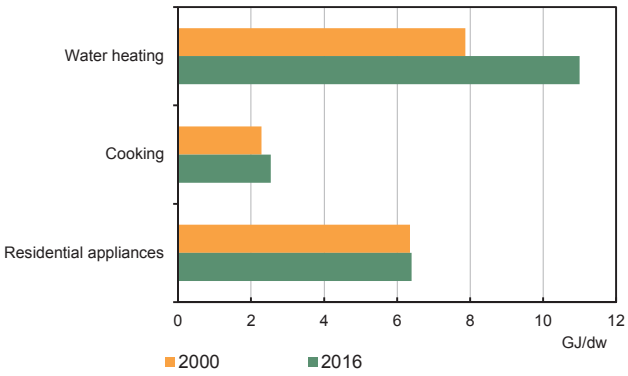
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



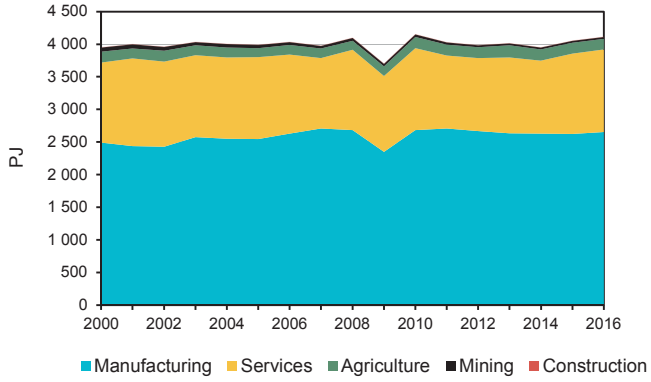
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

GERMANY

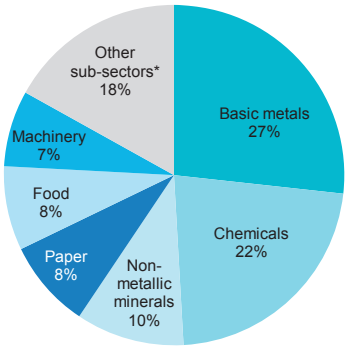
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	2 493	1 228	230	2 935	561	1 790
2016	2 651	1 259	190	3 553	746	2 182

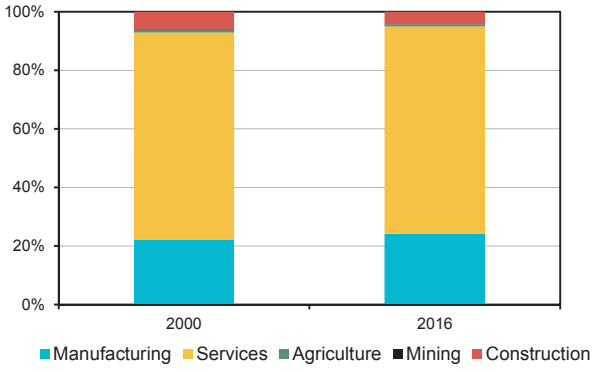
Industry and services energy consumption



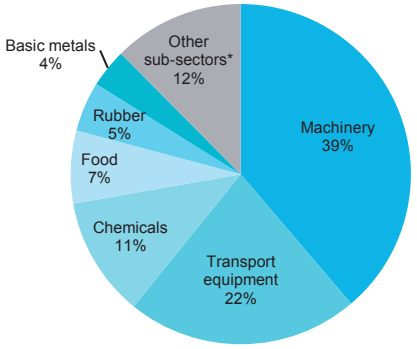
Manufacturing energy consumption by sub-sector, 2016



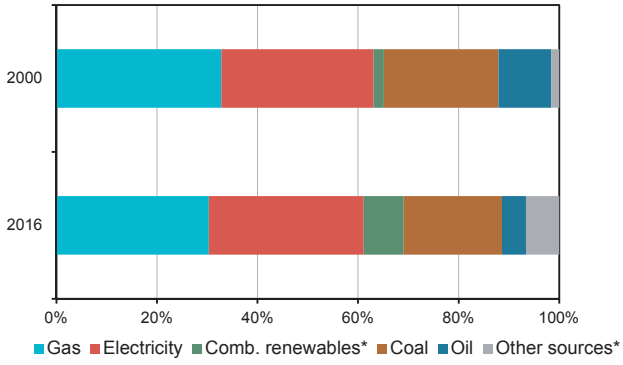
Value added** by sector



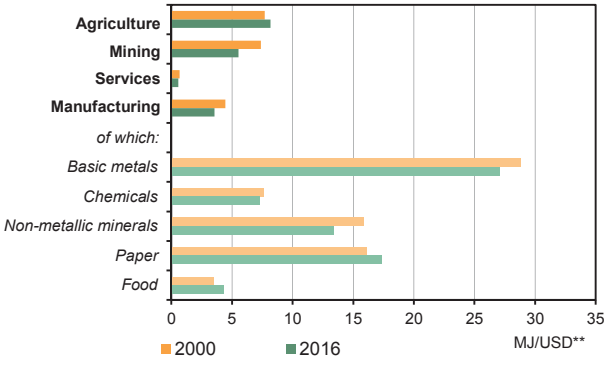
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



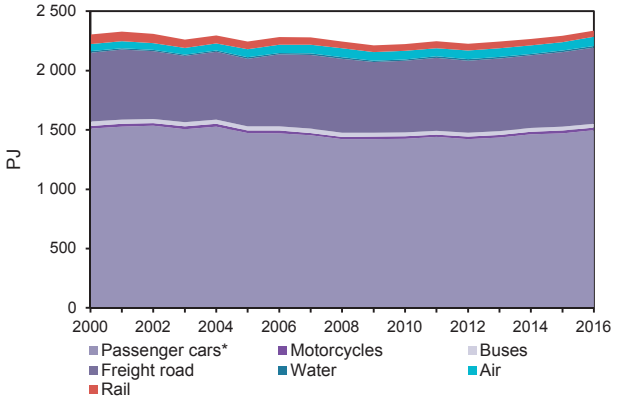
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

GERMANY

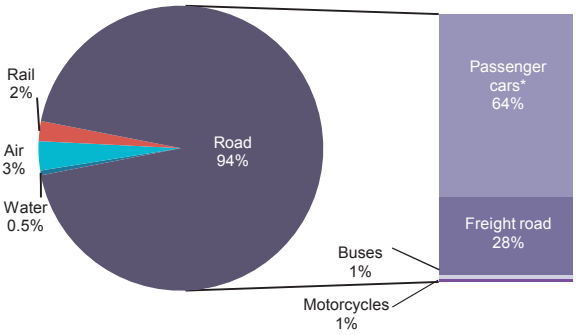
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	1 664	641	1 018	496	1.5	4.6
2016	1 649	688	1 154	635	1.5	4.9

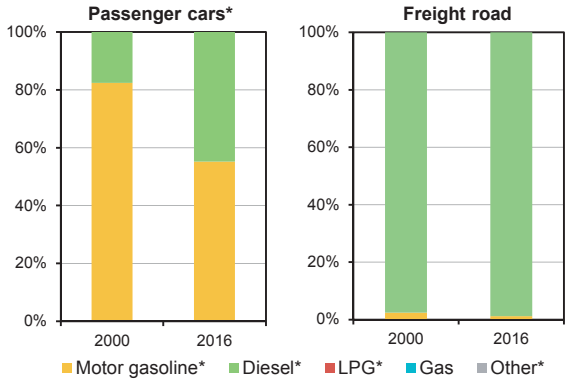
Transport energy consumption by mode/vehicle type



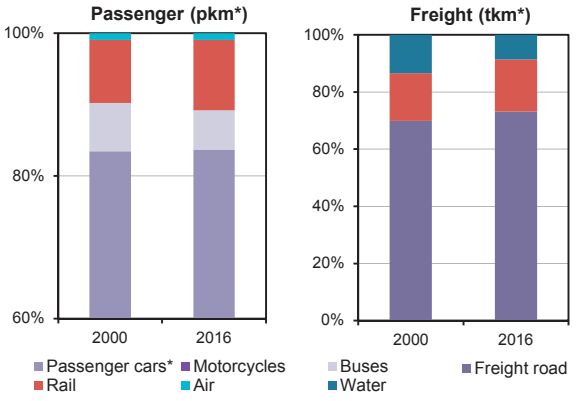
Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport

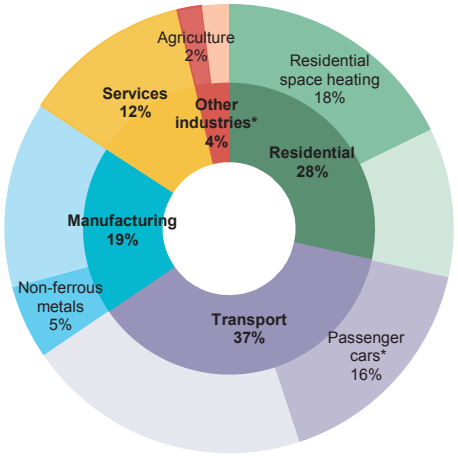
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

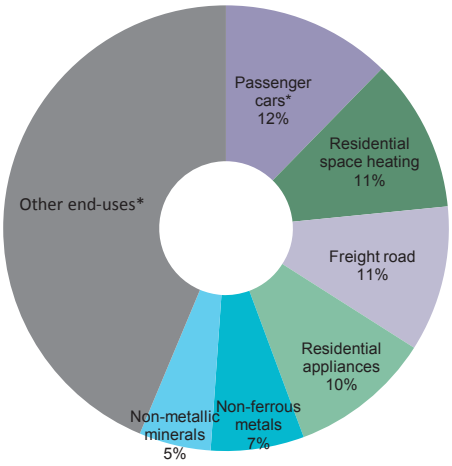
GREECE

Cross-sectoral overview

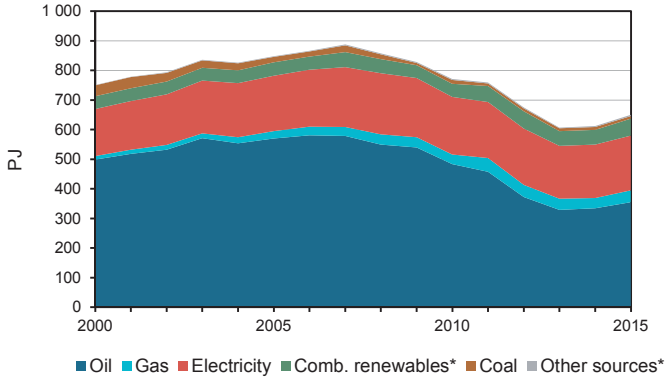
Largest end-uses by sector, 2015



Top six CO_2 emitting end-uses, 2015**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

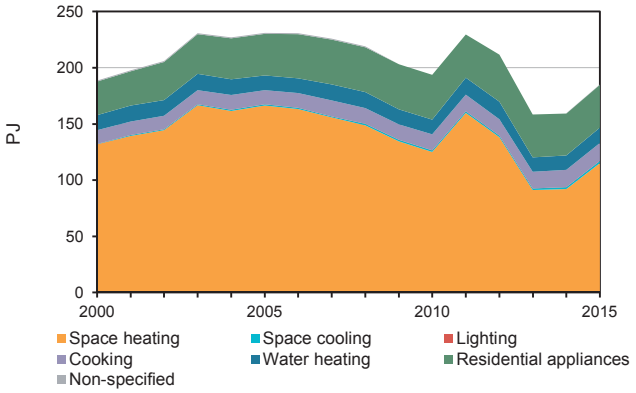
**Includes emissions reallocated from electricity and heat generation.

GREECE

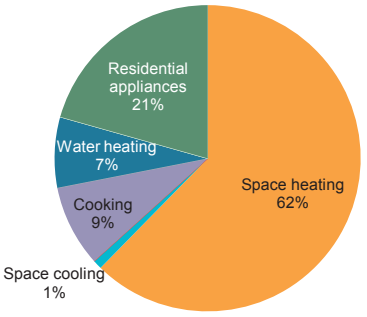
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	188	73	11	17	85	2.8
2015	185	60	11	17	88	2.5

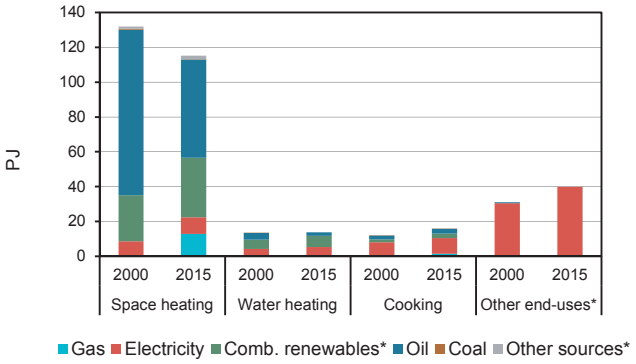
Residential energy consumption by end-use



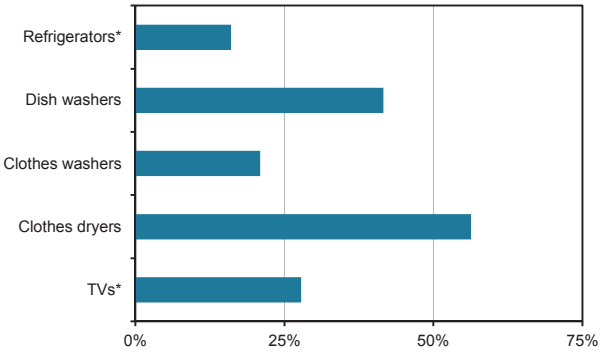
Residential energy consumption by end-use, 2015



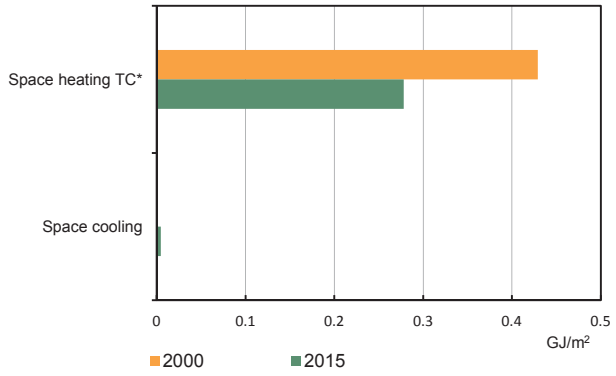
Residential energy consumption by source



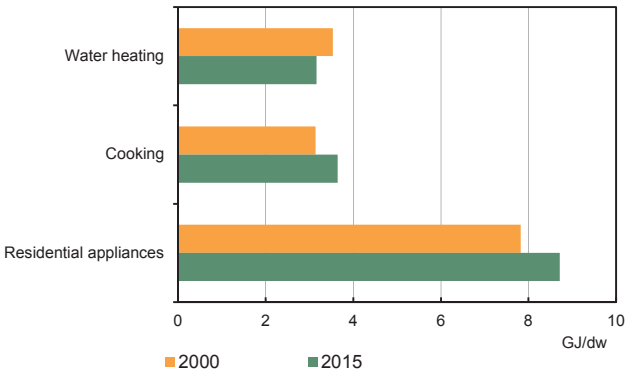
Appliances per dwelling, 2000-15 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



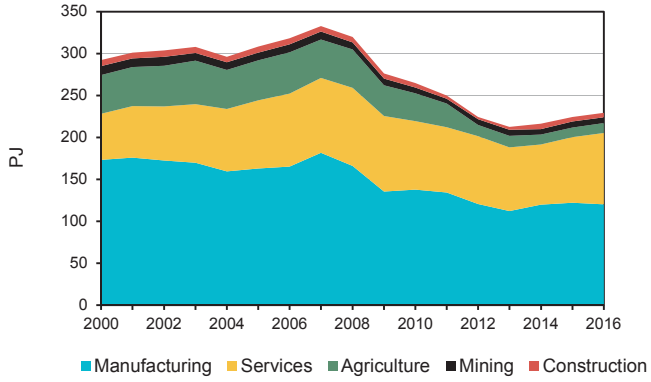
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

GREECE

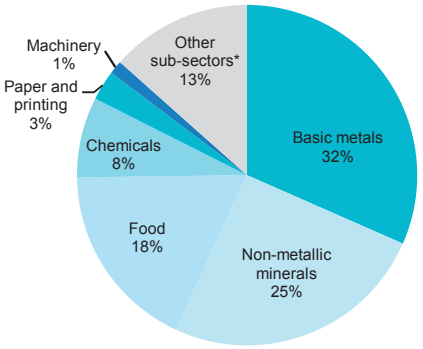
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	173	55	64	264	21	178
2015	122	78	24	257	18	189

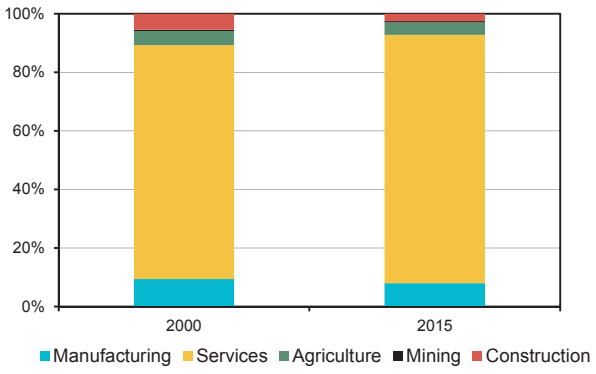
Industry and services energy consumption



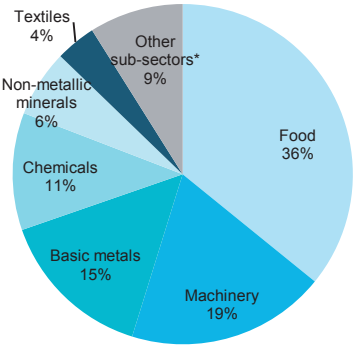
Manufacturing energy consumption by sub-sector, 2015



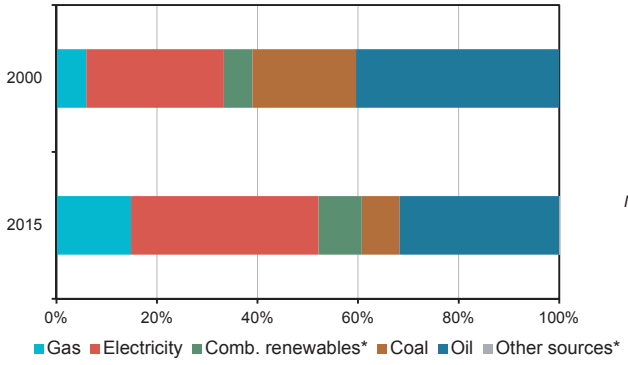
Value added** by sector



Manufacturing value added** by sub-sector, 2015



Manufacturing energy consumption by source



Selected energy intensities

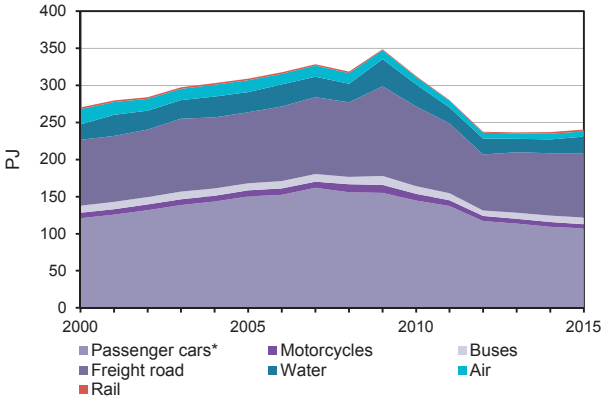
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

GREECE

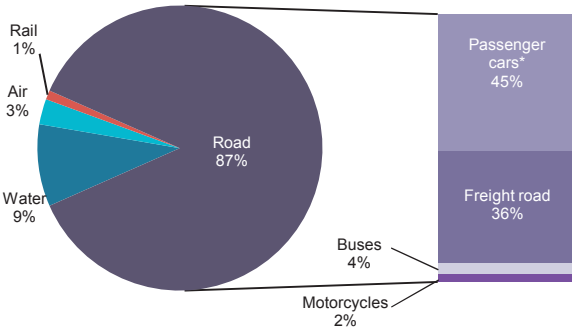
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	160	110	99	29	1.4	NA
2015	131	109	142	20	1.8	0.2

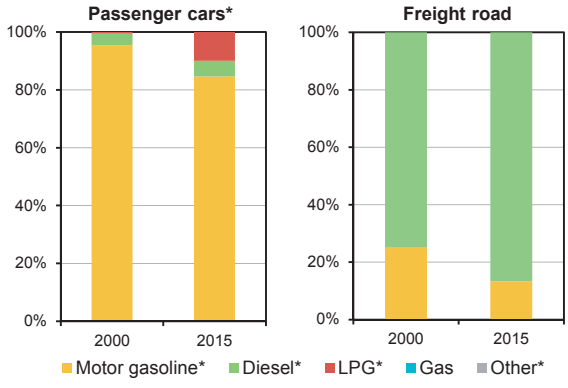
Transport energy consumption by mode/vehicle type



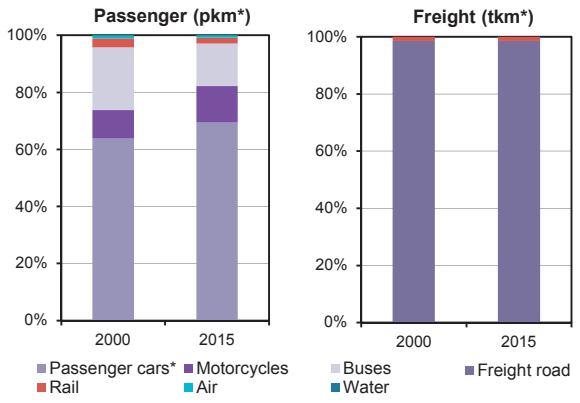
Transport energy consumption by mode/vehicle type, 2015



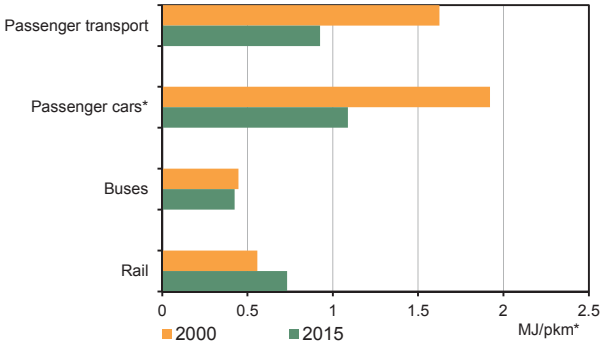
Energy consumption in road transport by source



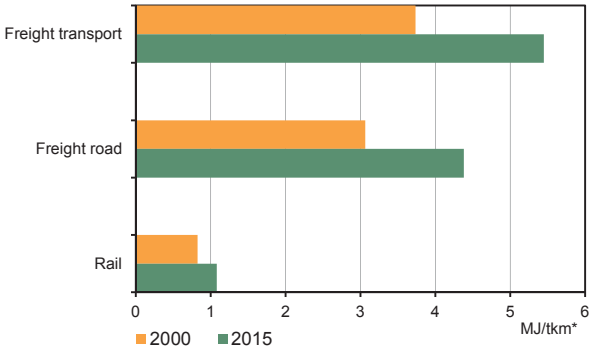
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport

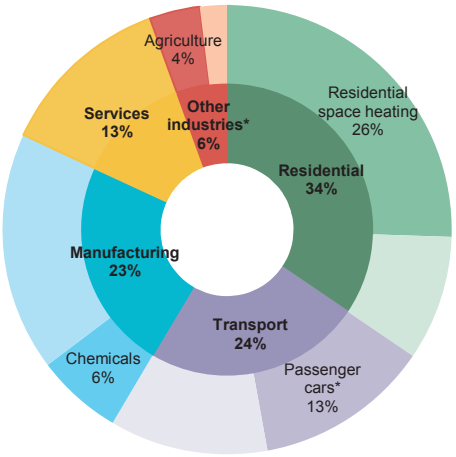


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

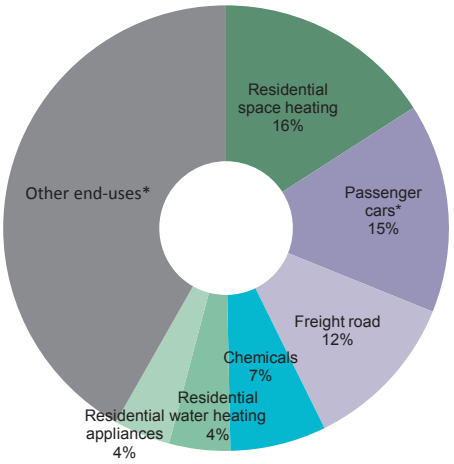
HUNGARY

Cross-sectoral overview

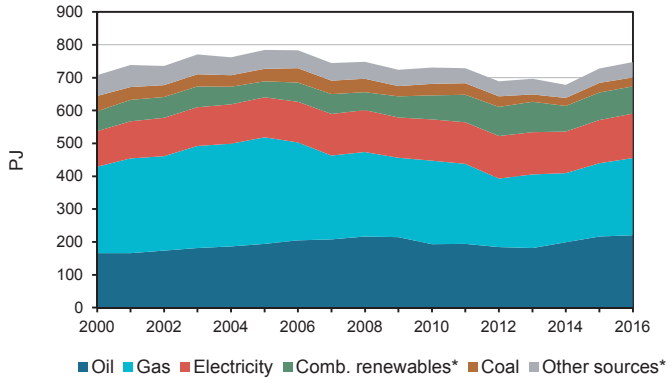
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

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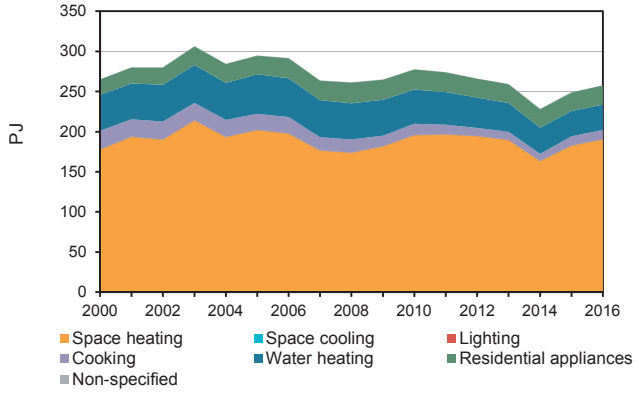
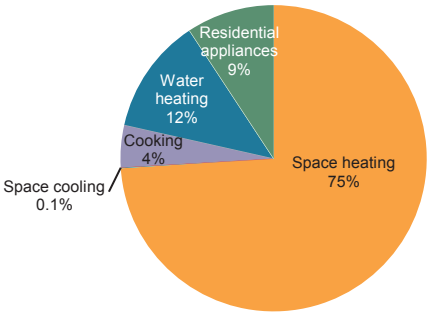
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	265	54	10	26	75	2.7
2016	258	54	10	26	82	2.5

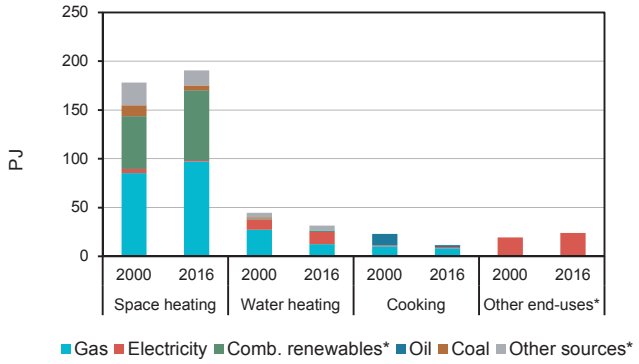
Residential energy consumption by end-use



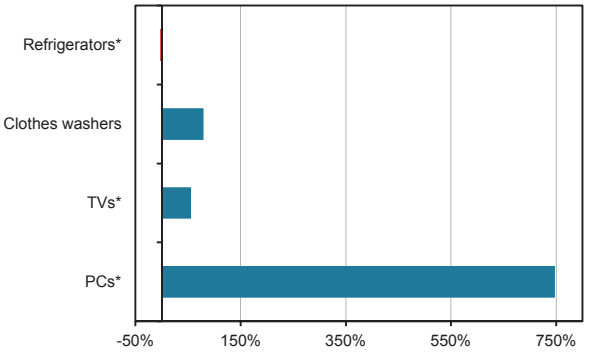
Residential energy consumption by end-use, 2016



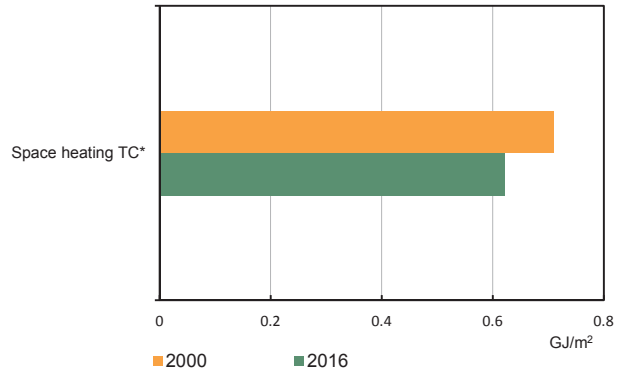
Residential energy consumption by source



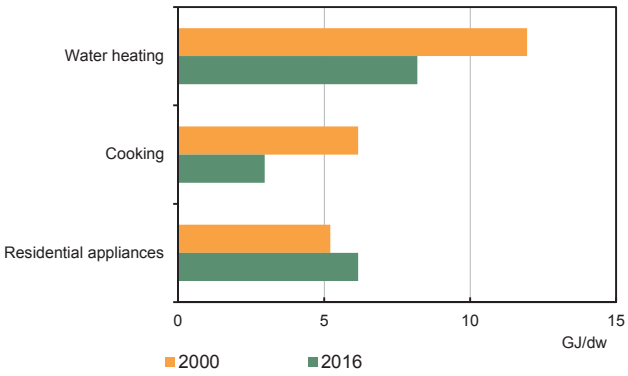
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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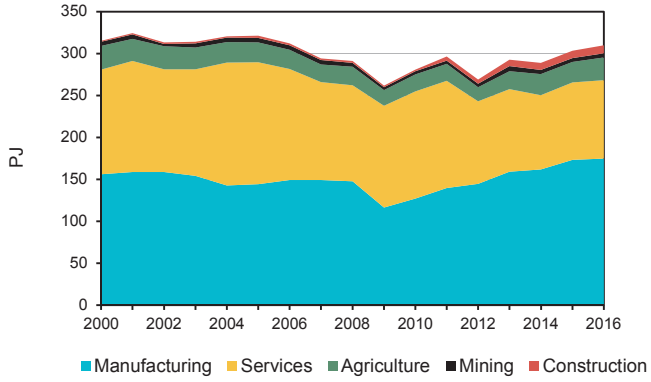
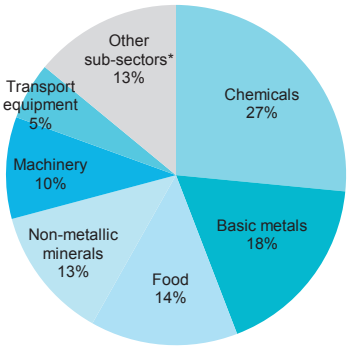
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	156	125	34	177	26	101
2016	175	93	42	243	44	139

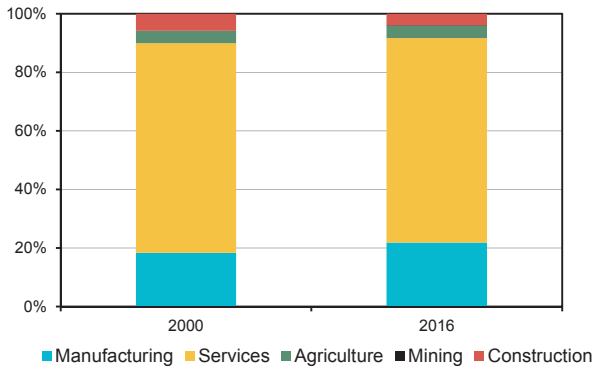
Industry and services energy consumption



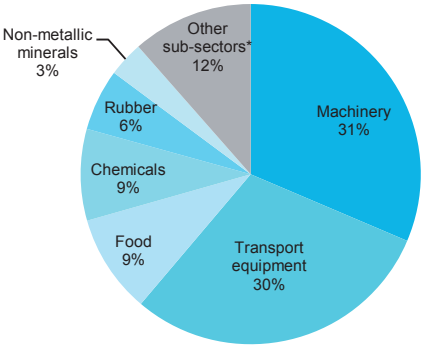
Manufacturing energy consumption by sub-sector, 2016



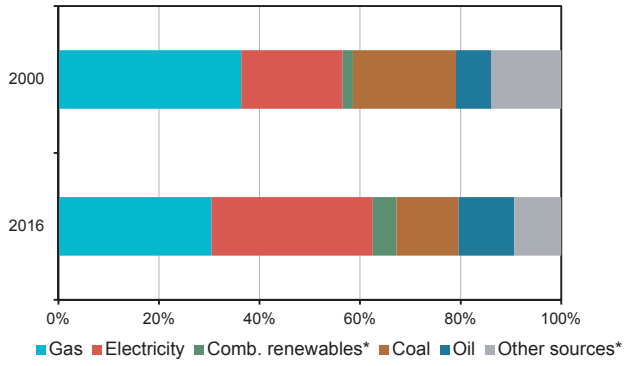
Value added** by sector



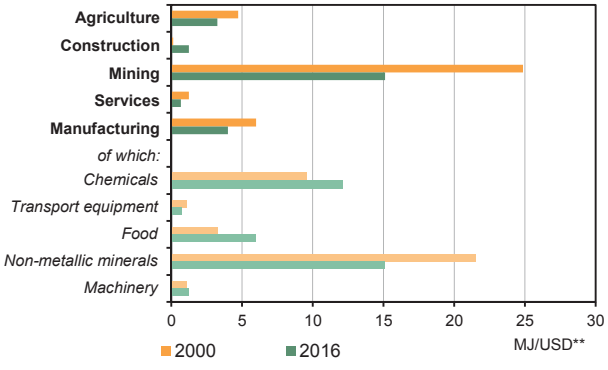
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



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**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

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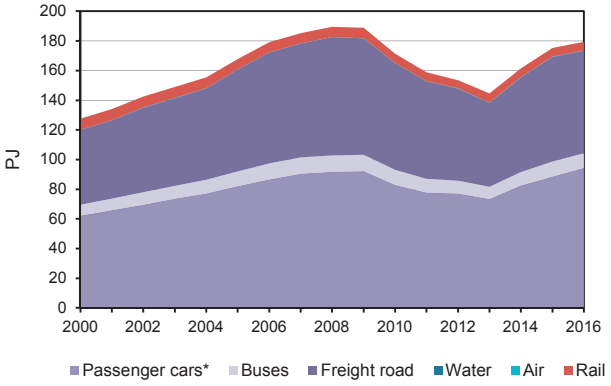
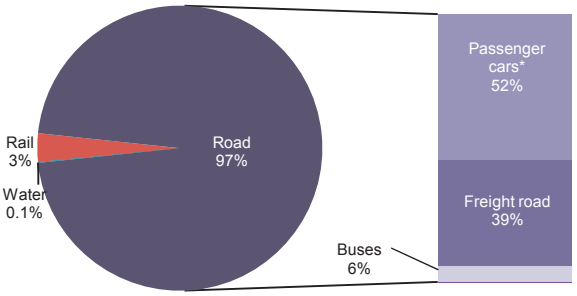
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	75	52	77	29	2.9	NA
2016	108	71	86	53	NA	NA

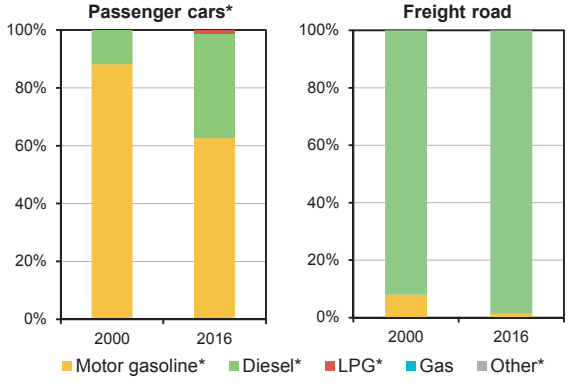
Transport energy consumption by mode/vehicle type



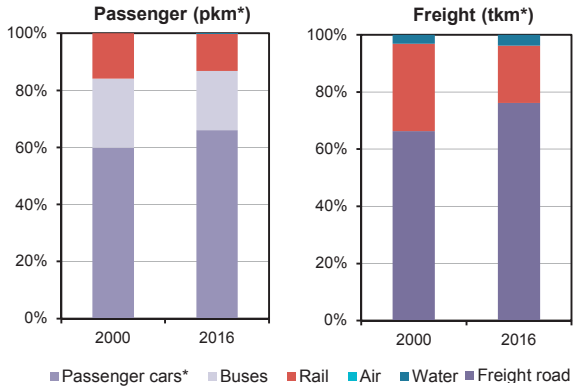
Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source

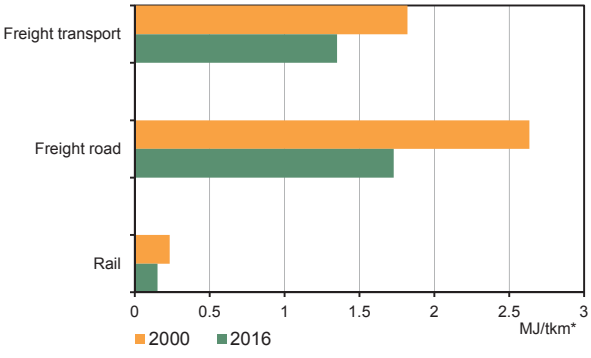


Transport activity by mode/vehicle type



Energy intensities for passenger transport

Energy intensities for freight transport



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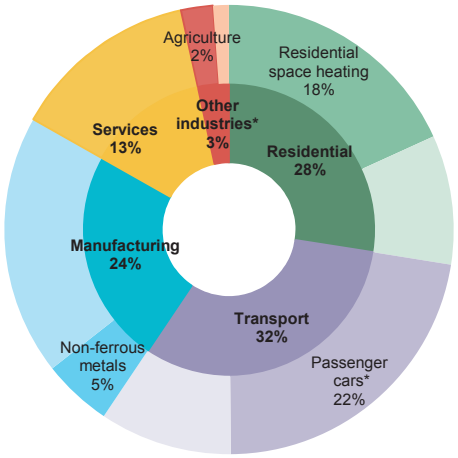
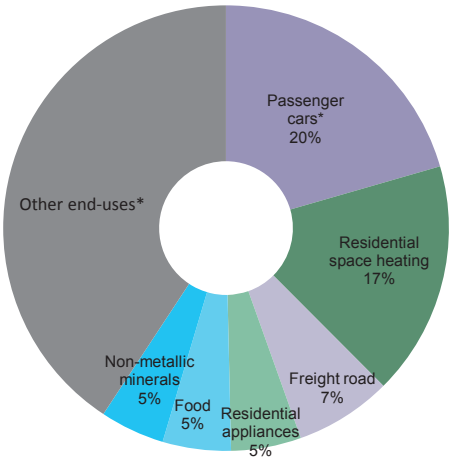
IRELAND

Cross-sectoral overview

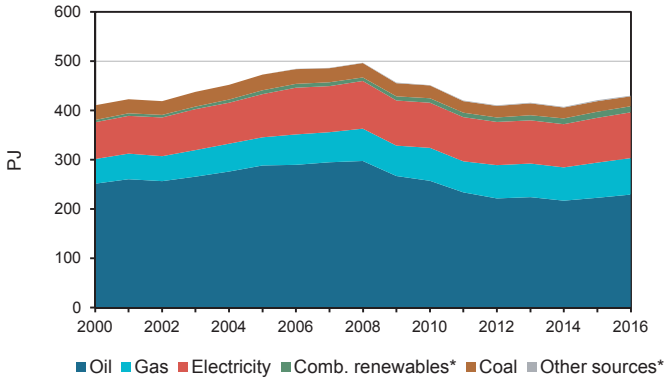
Largest end-uses by sector, 2016



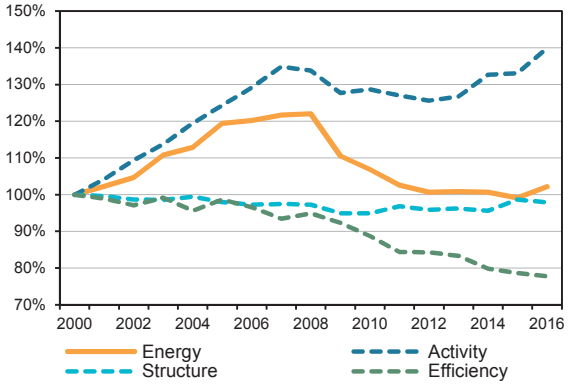
Top six CO_2 emitting end-uses, 2016**



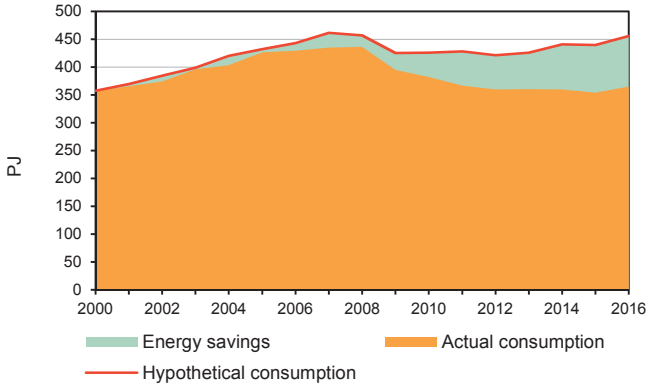
Final energy consumption by source



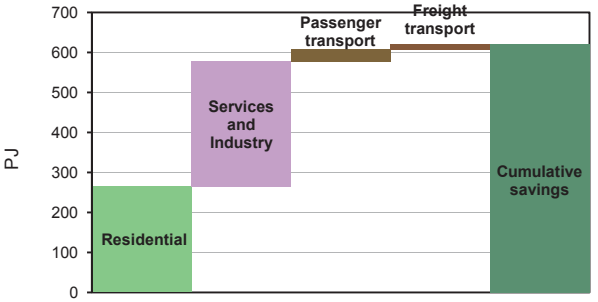
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



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**Includes emissions reallocated from electricity and heat generation.

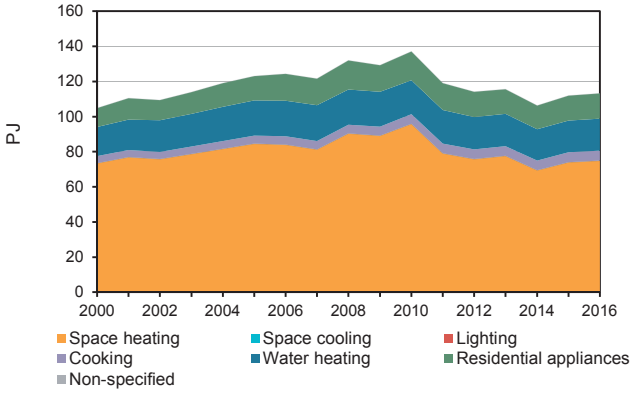
***These figures display results from the IEA decomposition analysis and cover approximately 93% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

IRELAND

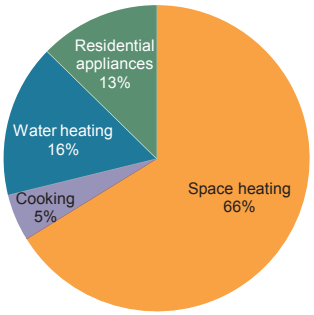
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	105	94	4	28	107	3.1
2016	113	91	5	24	121	2.7

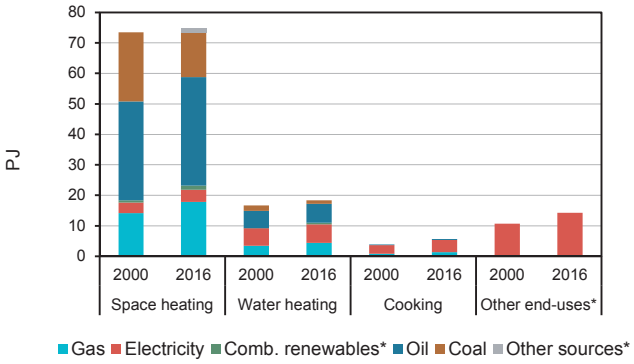
Residential energy consumption by end-use



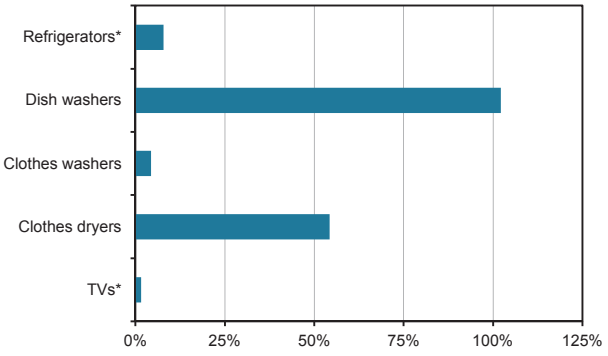
Residential energy consumption by end-use, 2016



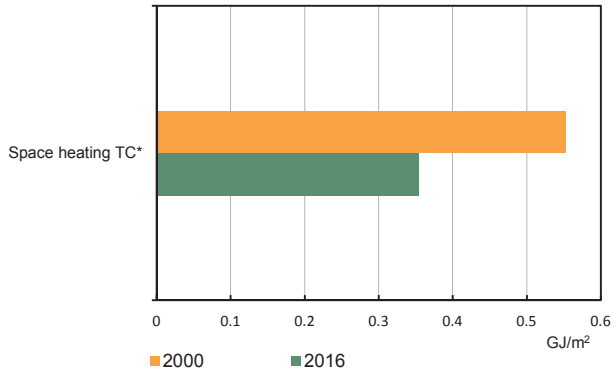
Residential energy consumption by source



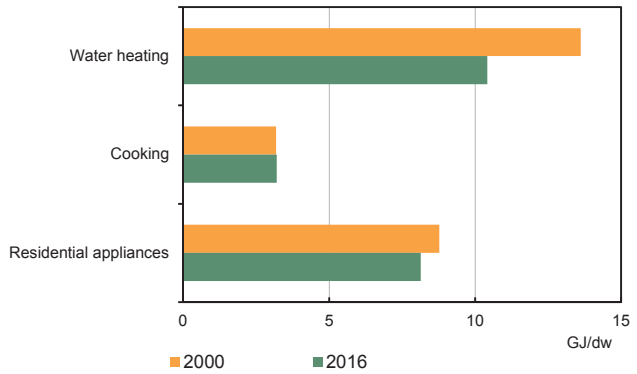
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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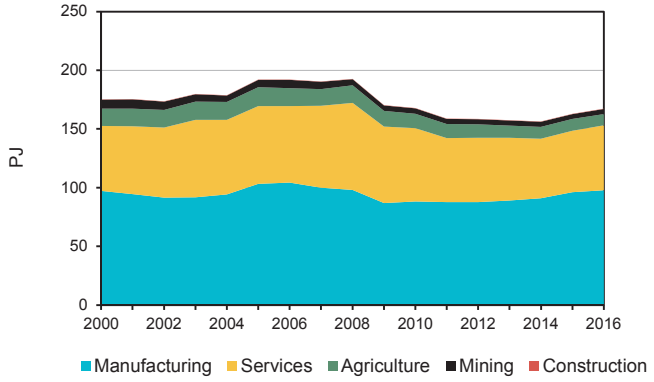
IRELAND

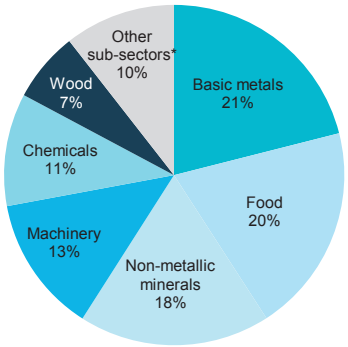
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	97	55	22	146	32	87
2016	98	55	14	296	79	162

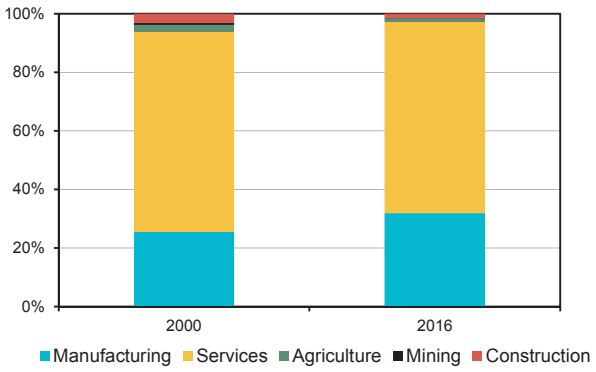
Industry and services energy consumption



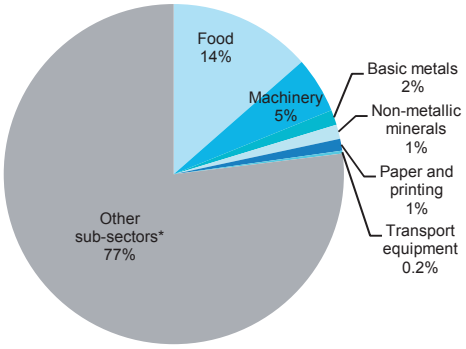
Manufacturing energy consumption by sub-sector, 2016



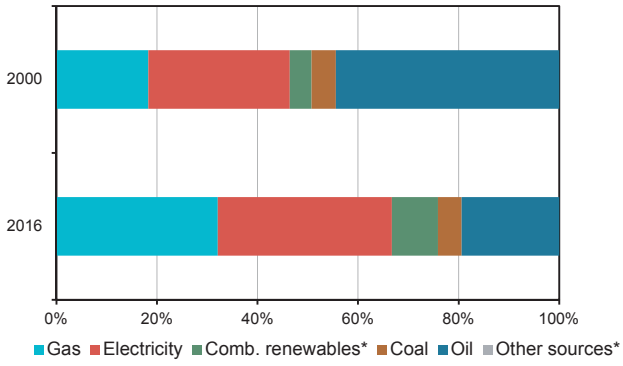
Value added** by sector



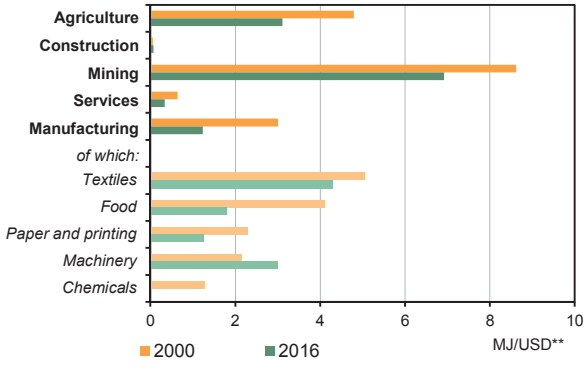
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



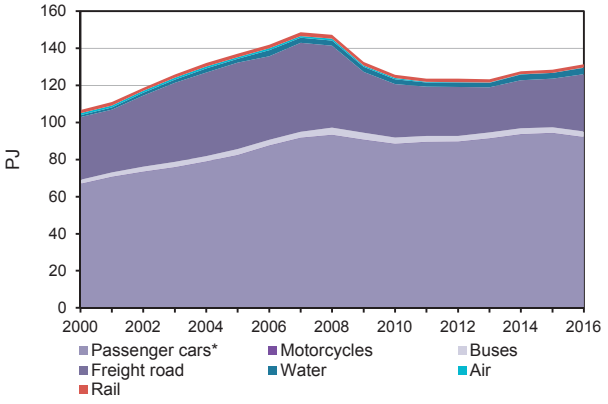
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

IRELAND

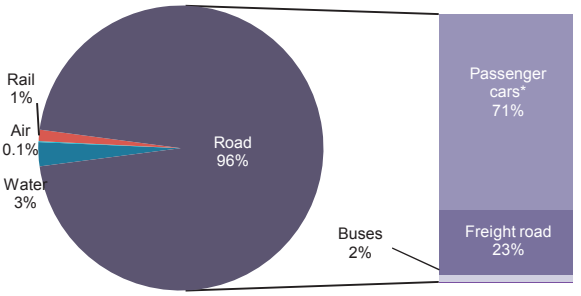
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	72	35	42	13	1.5	NA
2016	97	34	66	12	1.5	NA

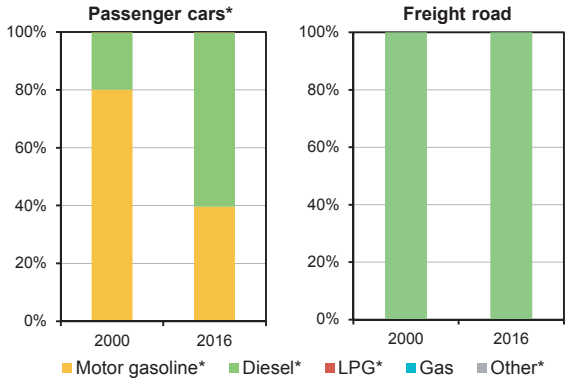
Transport energy consumption by mode/vehicle type



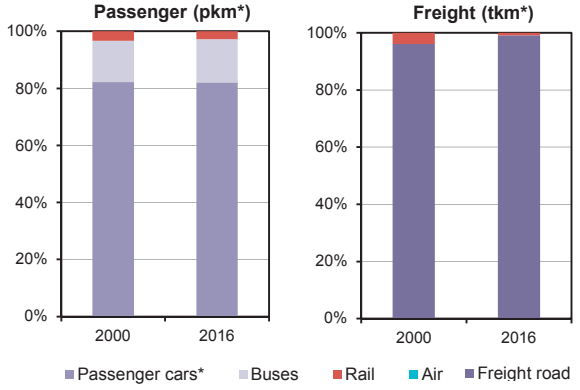
Transport energy consumption by mode/vehicle type, 2016



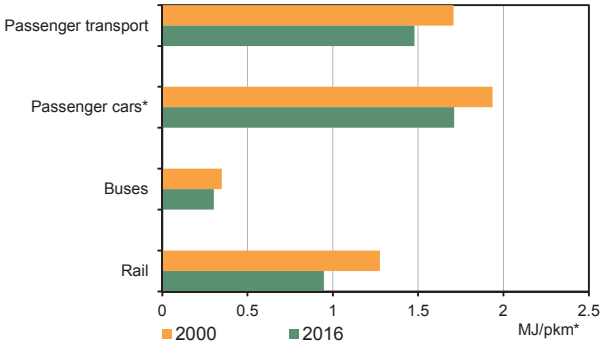
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



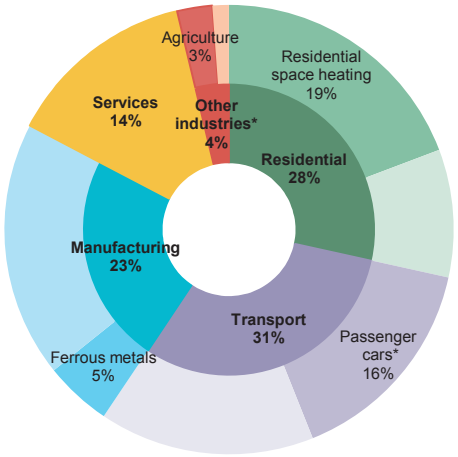
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

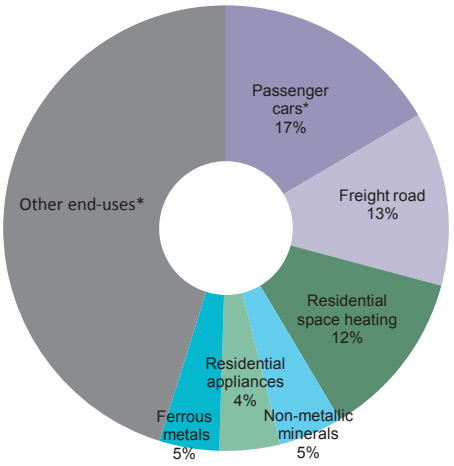
ITALY

Cross-sectoral overview

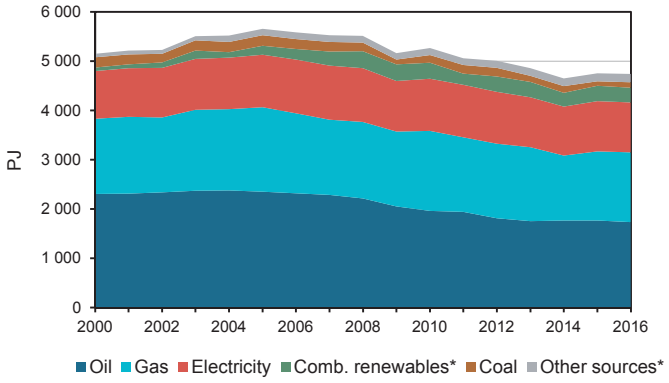
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

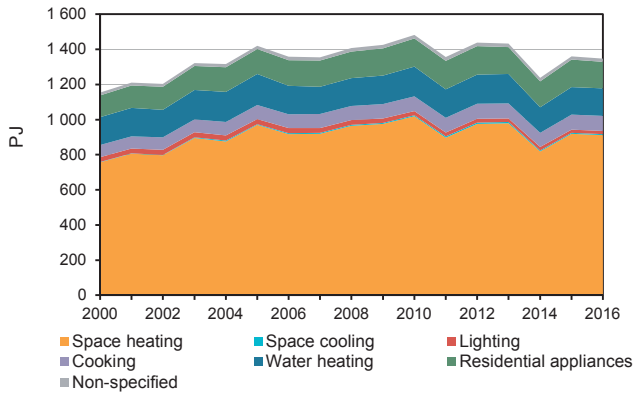
**Includes emissions reallocated from electricity and heat generation.

ITALY

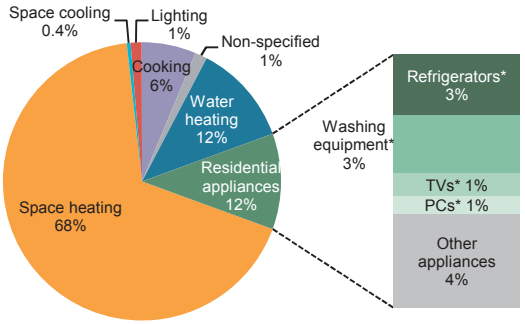
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	1 155	93	57	20	96	2.6
2016	1 348	69	61	22	93	2.5

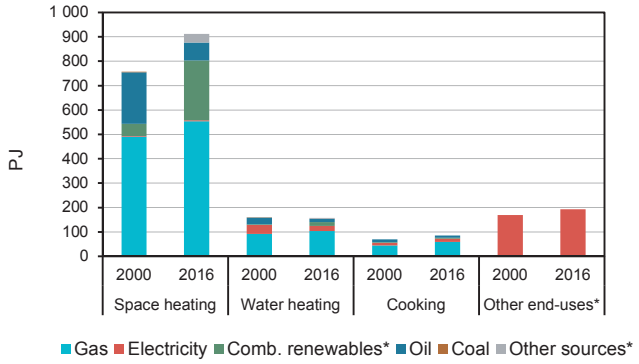
Residential energy consumption by end-use



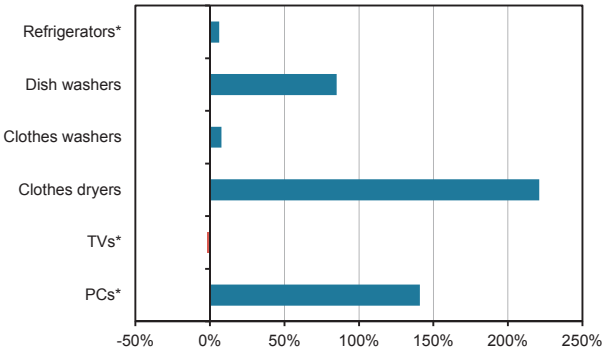
Residential energy consumption by end-use, 2016



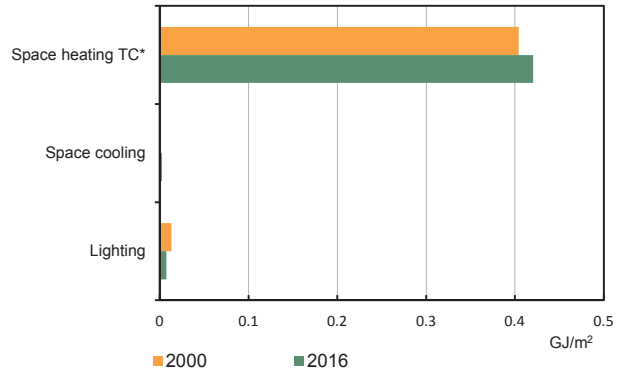
Residential energy consumption by source



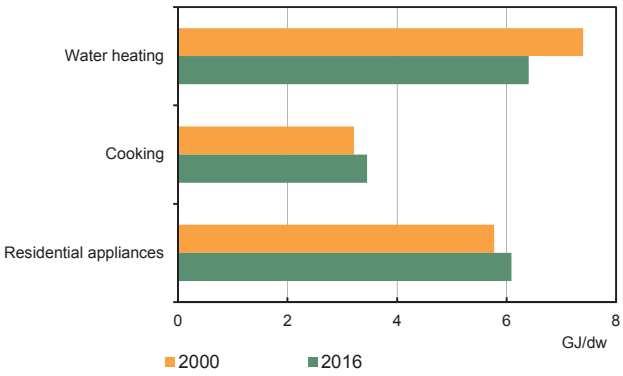
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



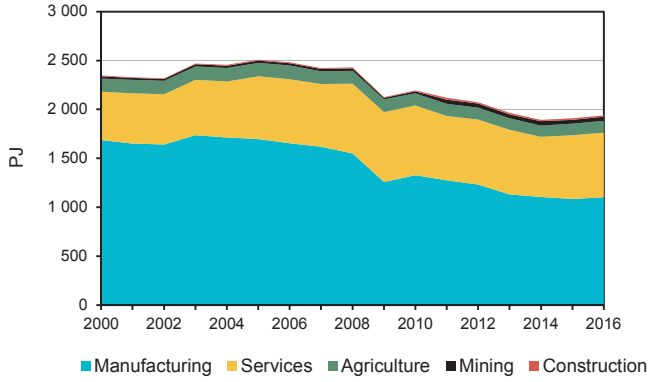
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

ITALY

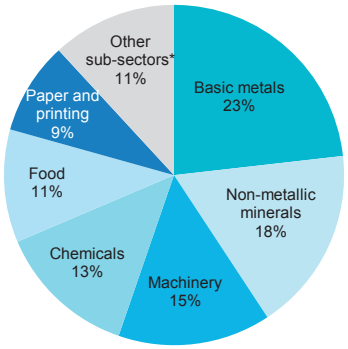
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	1 687	475	166	2 016	311	1 302
2016	1 102	624	176	2 038	299	1 373

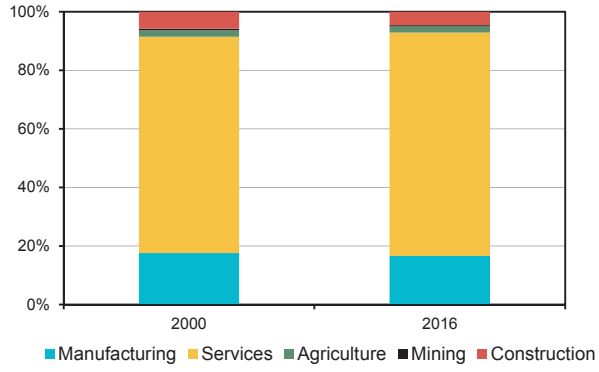
Industry and services energy consumption



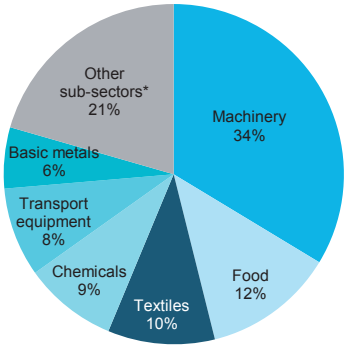
Manufacturing energy consumption by sub-sector, 2016



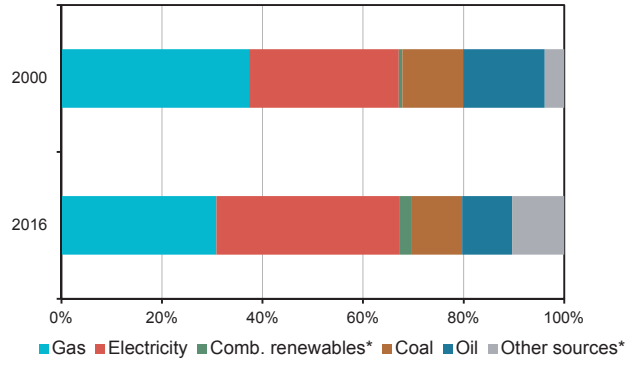
Value added** by sector



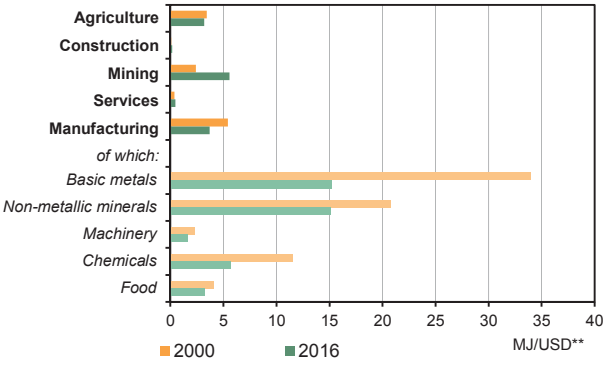
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



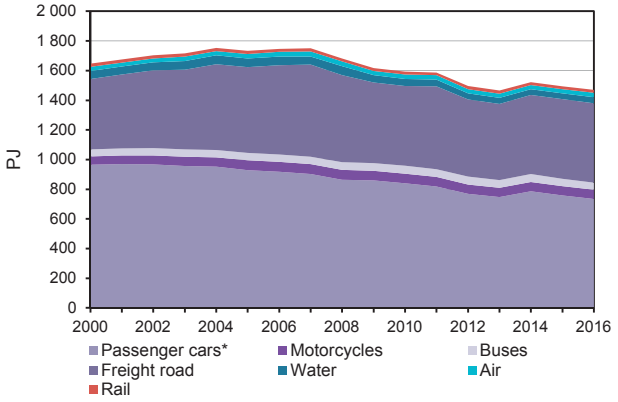
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

ITALY

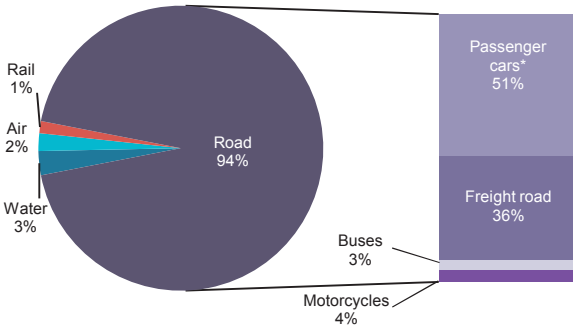
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	1 109	539	926	245	1.6	1.2
2016	887	583	928	188	1.6	NA

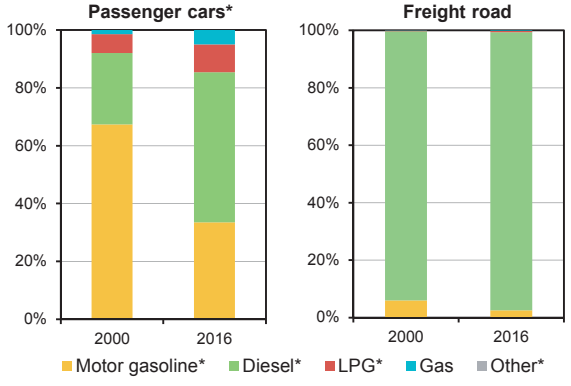
Transport energy consumption by mode/vehicle type



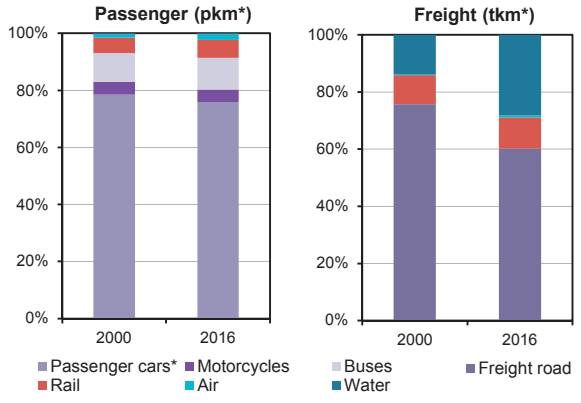
Transport energy consumption by mode/vehicle type, 2016



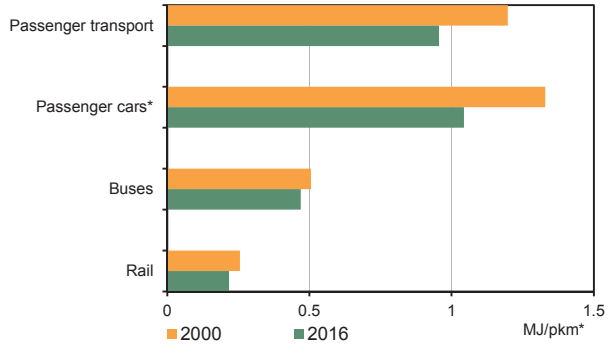
Energy consumption in road transport by source



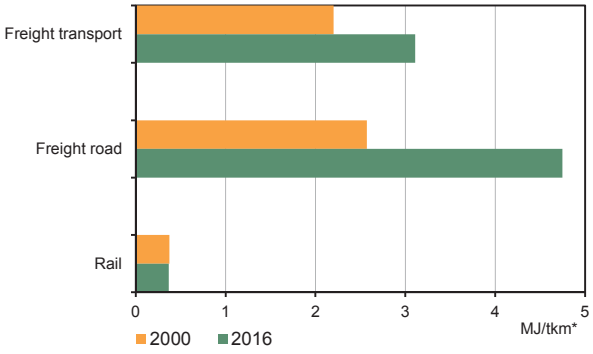
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport



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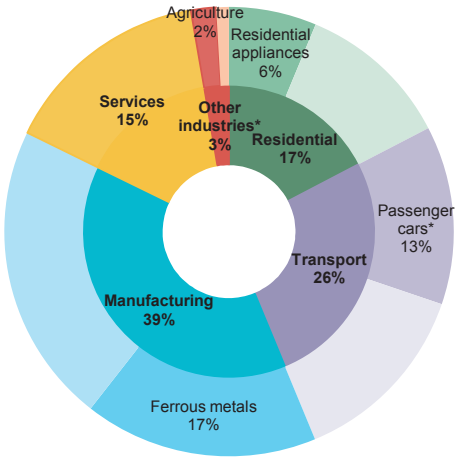
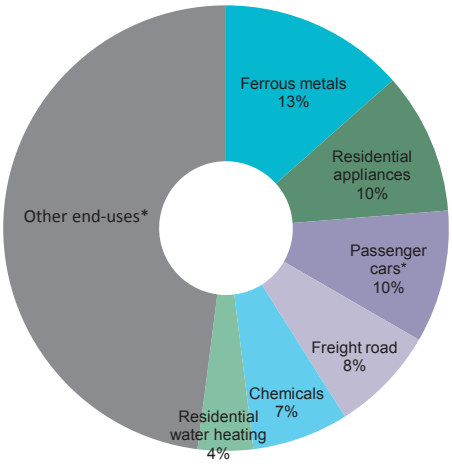
JAPAN

Cross-sectoral overview

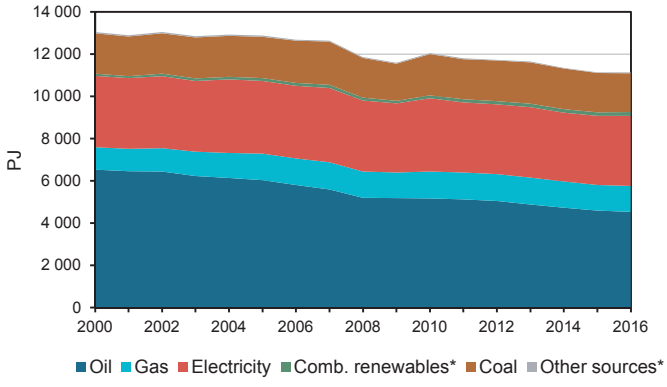
Largest end-uses by sector, 2016



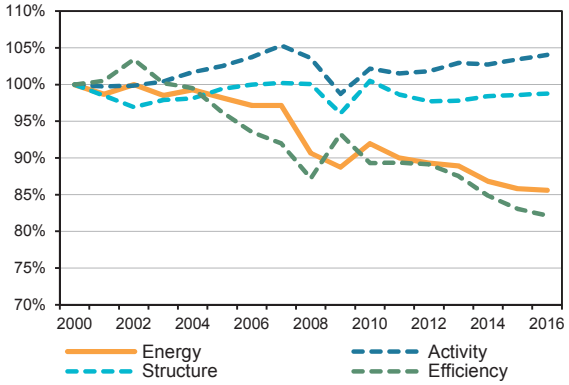
Top six CO_2 emitting end-uses, 2016**



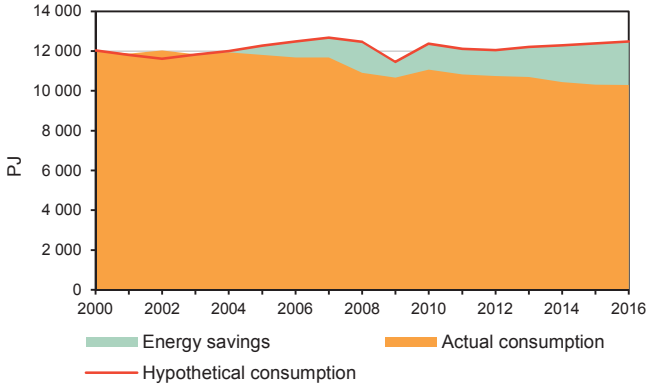
Final energy consumption by source



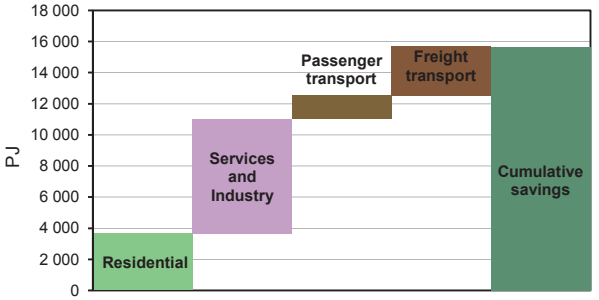
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



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**Includes emissions reallocated from electricity and heat generation.

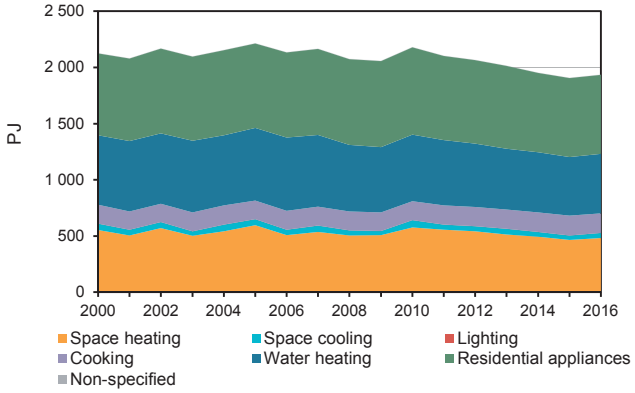
***These figures display results from the IEA decomposition analysis and cover approximately 93% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

JAPAN

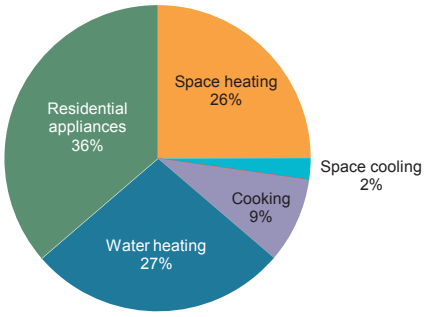
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	2 124	89	127	17	93	2.8
2016	1 935	81	127	15	95	2.4

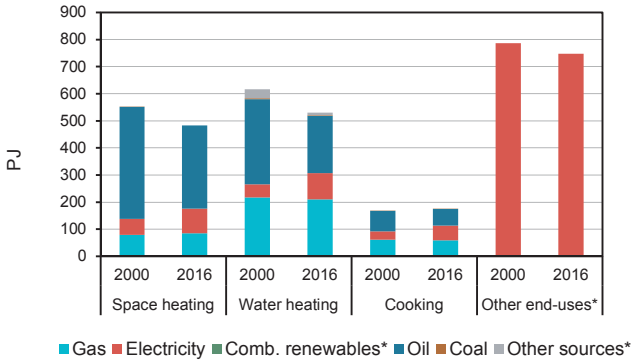
Residential energy consumption by end-use



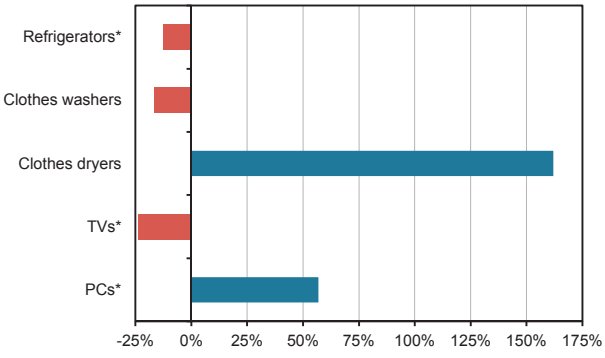
Residential energy consumption by end-use, 2016



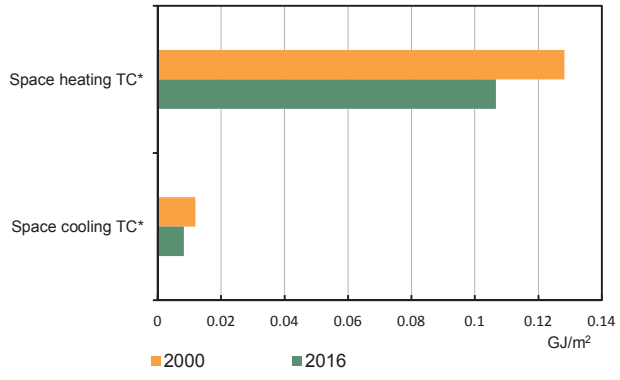
Residential energy consumption by source



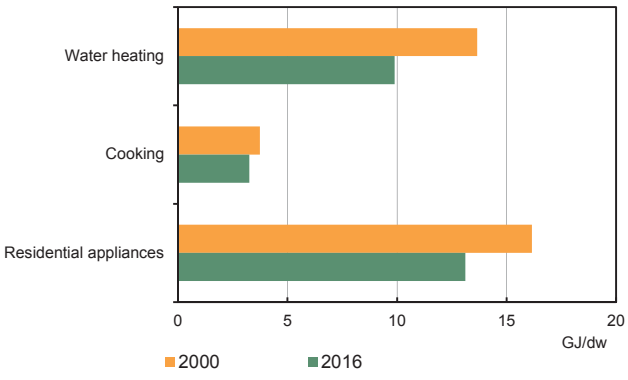
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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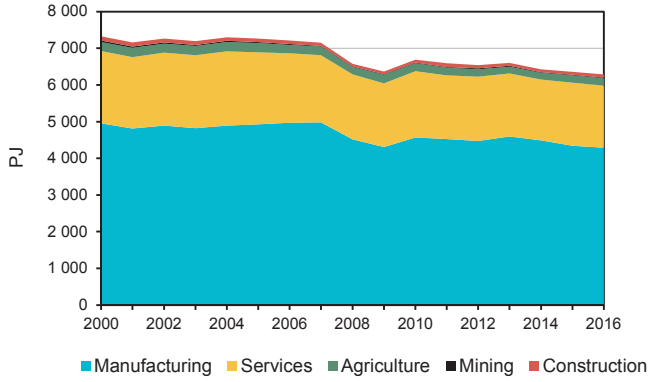
JAPAN

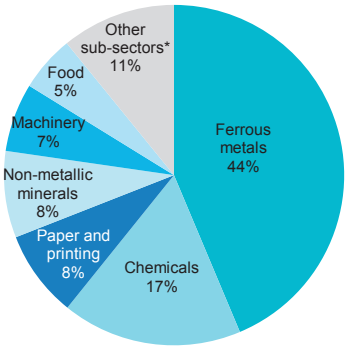
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	4 955	1 966	406	4 206	674	2 553
2016	4 288	1 672	304	4 755	826	2 835

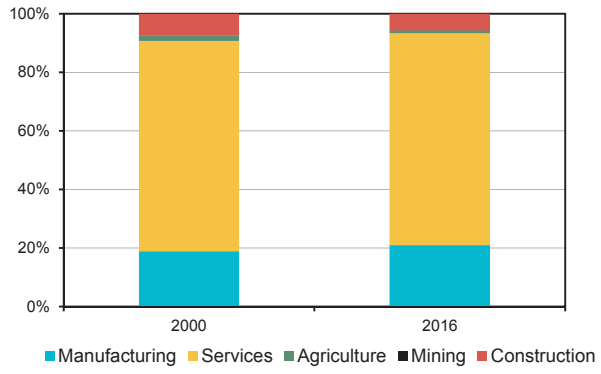
Industry and services energy consumption



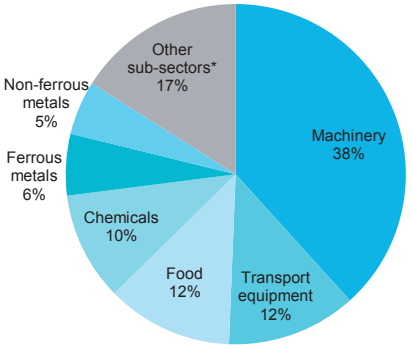
Manufacturing energy consumption by sub-sector, 2016



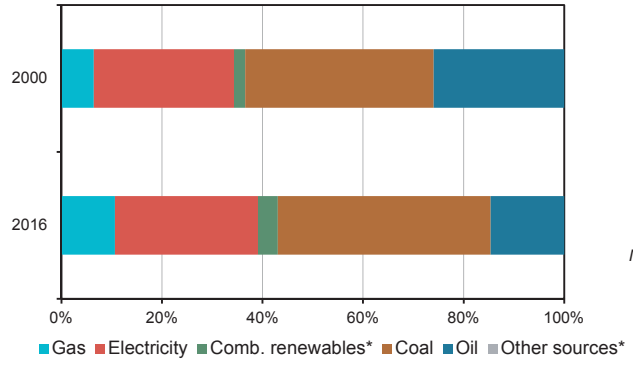
Value added** by sector



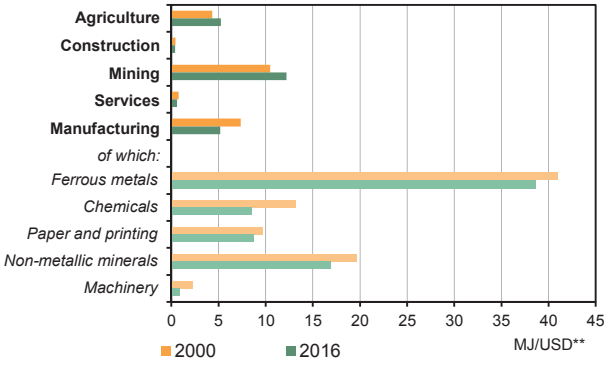
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



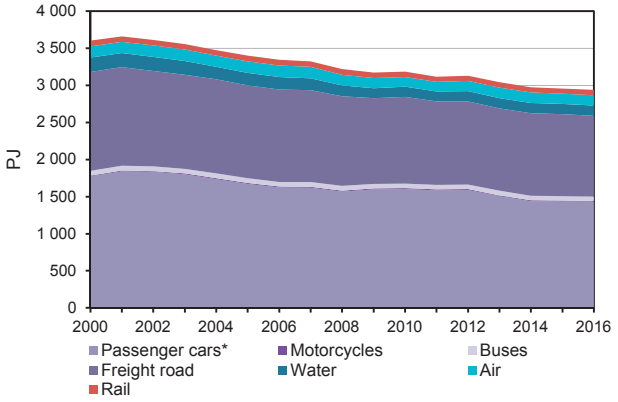
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2005; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

JAPAN

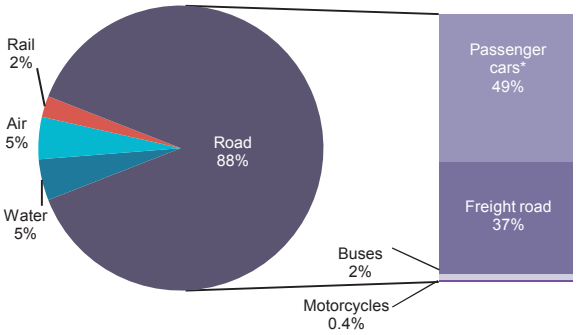
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	2 118	1 486	1 420	479	1.8	0.9
2016	1 736	1 202	1 400	415	1.5	1.1

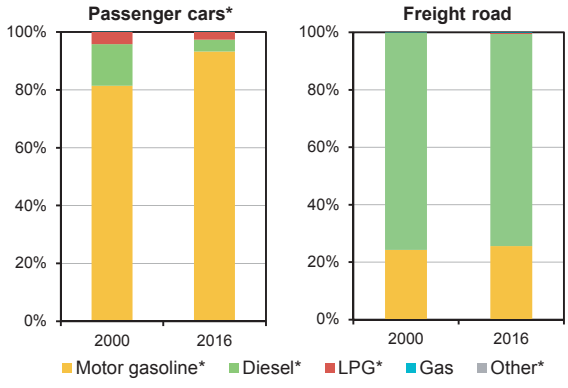
Transport energy consumption by mode/vehicle type



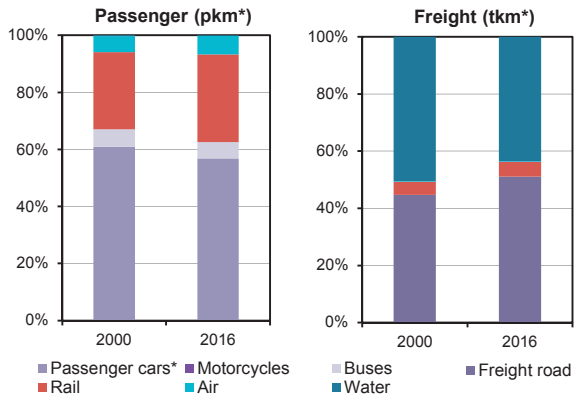
Transport energy consumption by mode/vehicle type, 2016



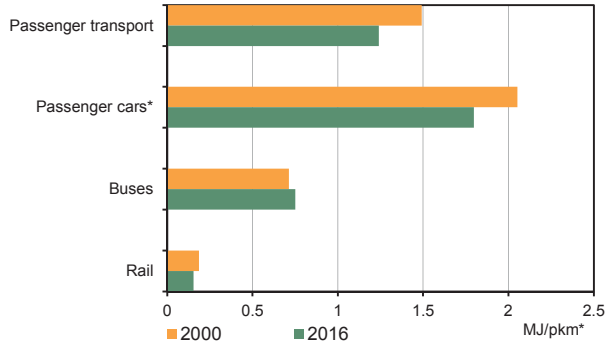
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



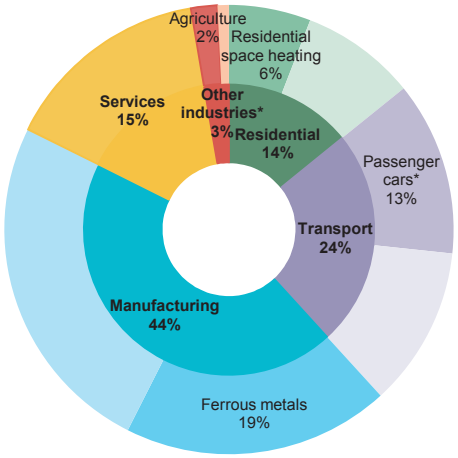
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

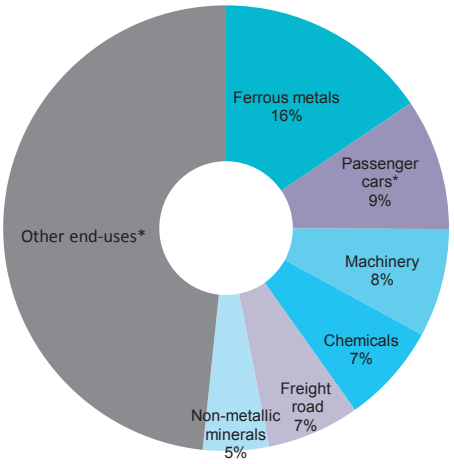
KOREA

Cross-sectoral overview

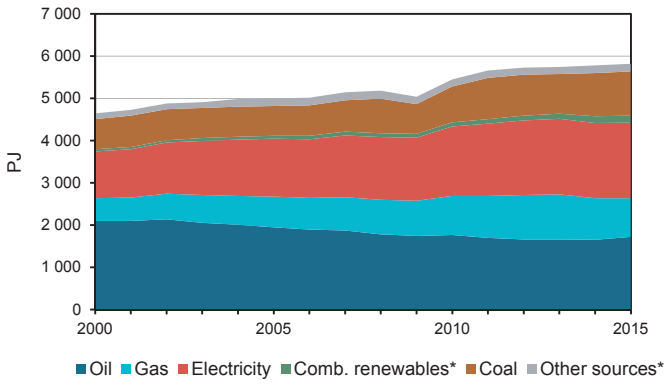
Largest end-uses by sector, 2015



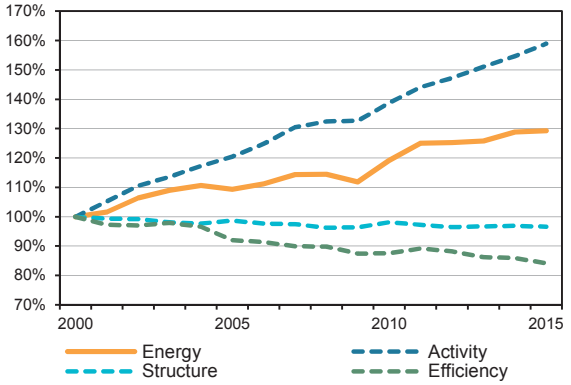
Top six CO_2 emitting end-uses, 2015**



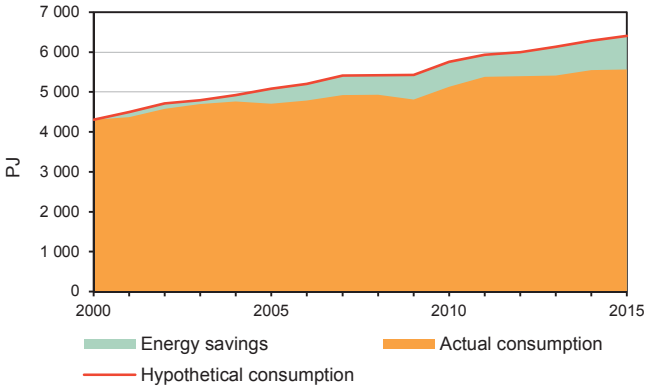
Final energy consumption by source



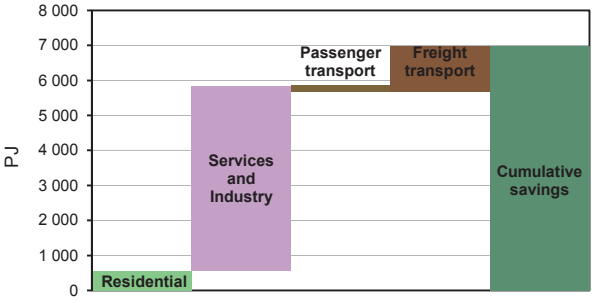
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-15***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

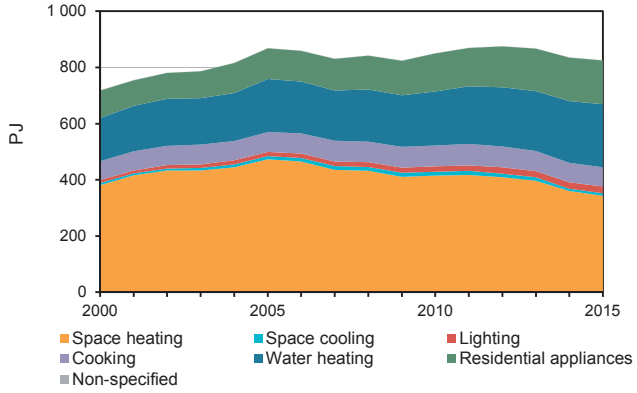
***These figures display results from the IEA decomposition analysis and cover approximately 97% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

KOREA

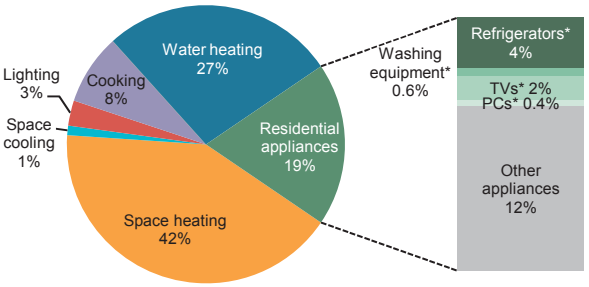
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	718	87	47	15	86	4.3
2015	825	77	51	16	93	3.3

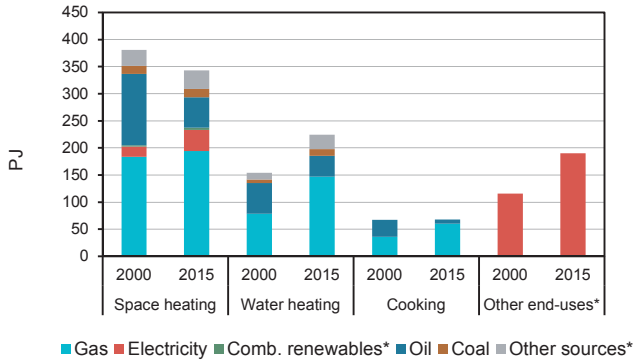
Residential energy consumption by end-use



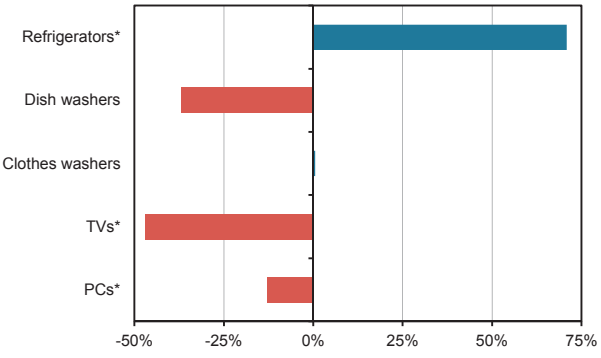
Residential energy consumption by end-use, 2015



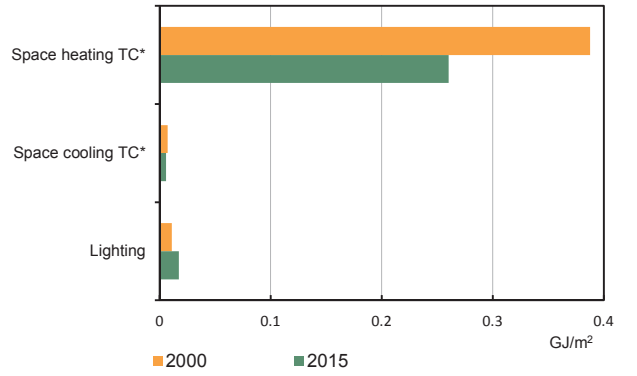
Residential energy consumption by source



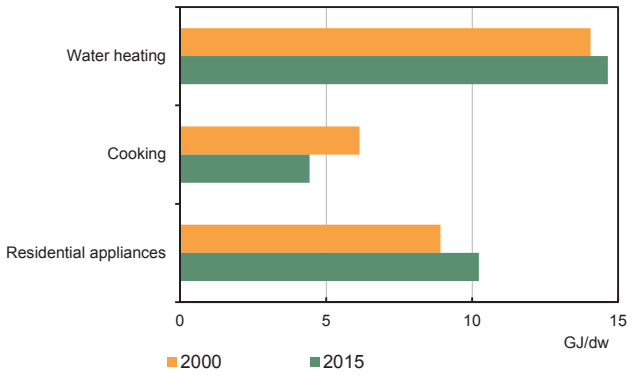
Appliances per dwelling, 2000-15 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



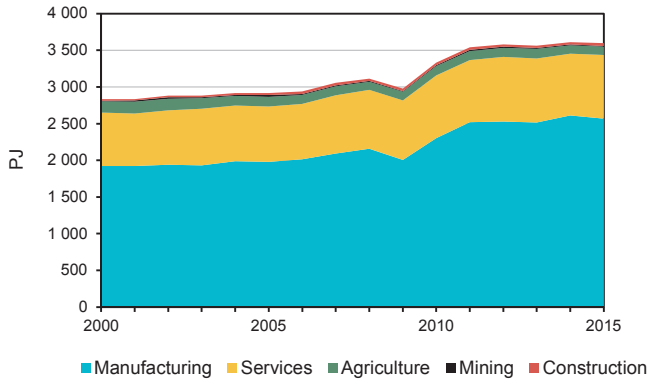
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

KOREA

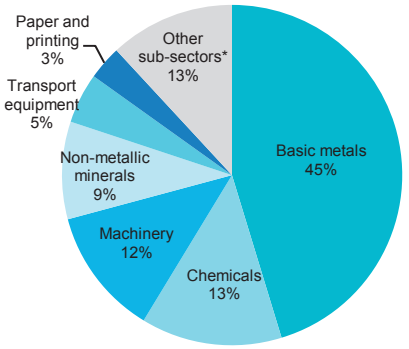
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	1 923	730	180	977	216	541
2015	2 568	867	159	1 745	488	934

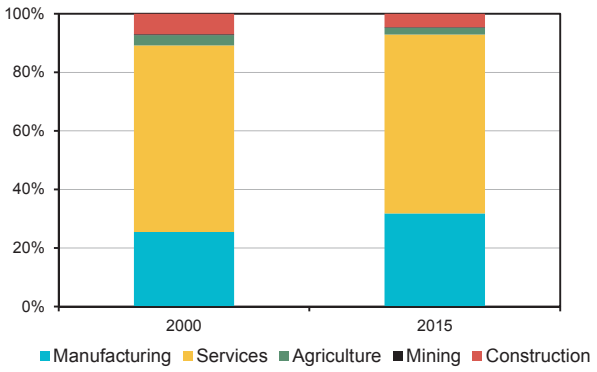
Industry and services energy consumption



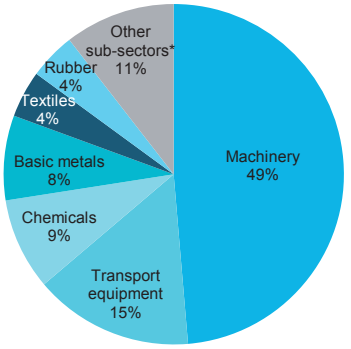
Manufacturing energy consumption by sub-sector, 2015



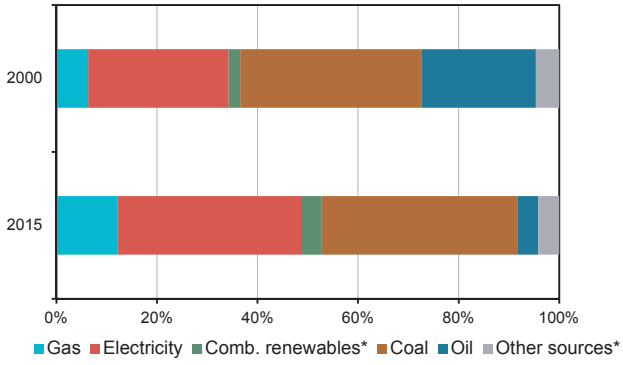
Value added** by sector



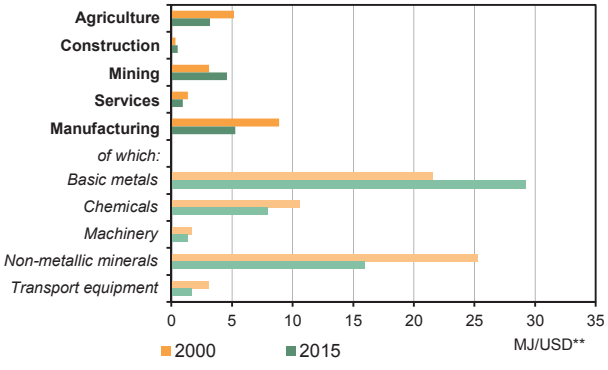
Manufacturing value added** by sub-sector, 2015



Manufacturing energy consumption by source



Selected energy intensities



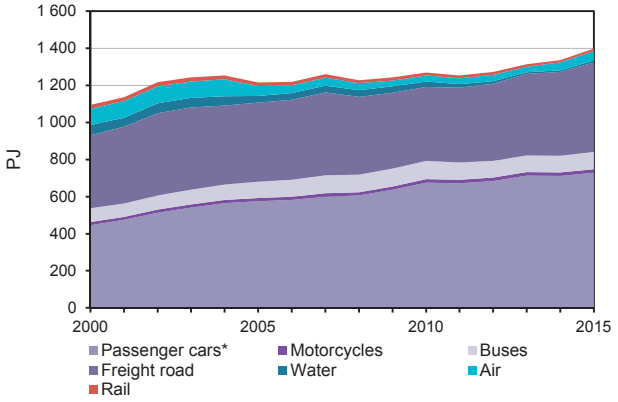
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

KOREA

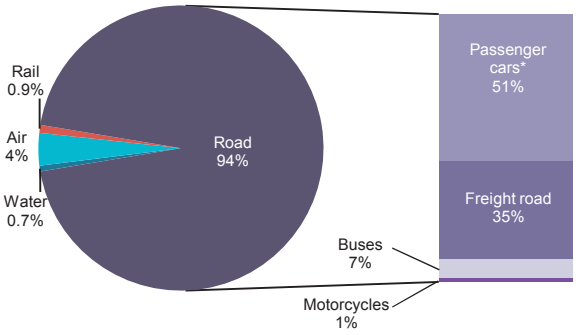
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	626	468	512	106	3.8	2.9
2015	899	499	759	159	3.9	2.9

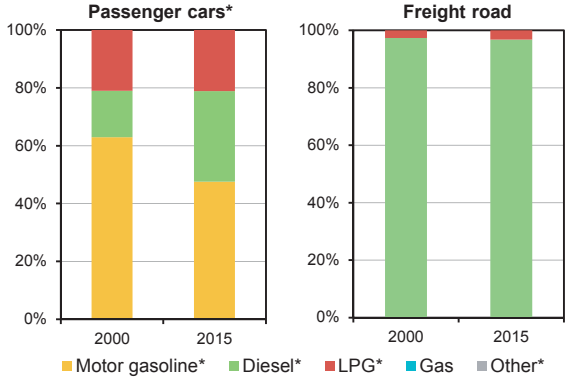
Transport energy consumption by mode/vehicle type



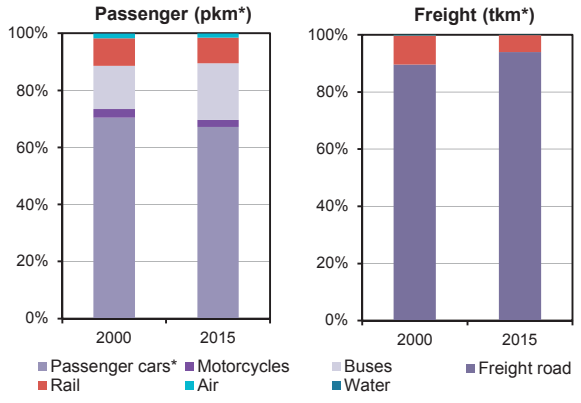
Transport energy consumption by mode/vehicle type, 2015



Energy consumption in road transport by source

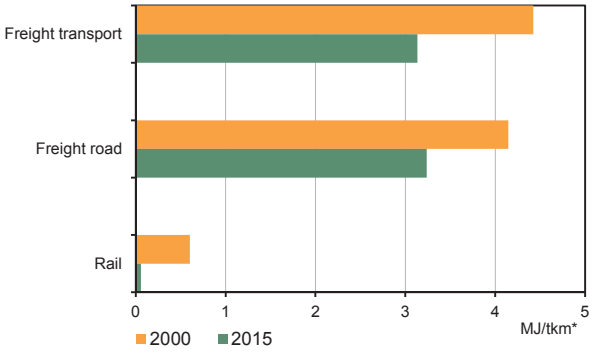


Transport activity by mode/vehicle type



Energy intensities for passenger transport

Energy intensities for freight transport



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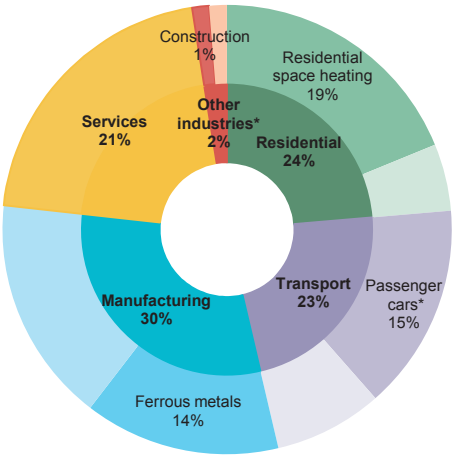
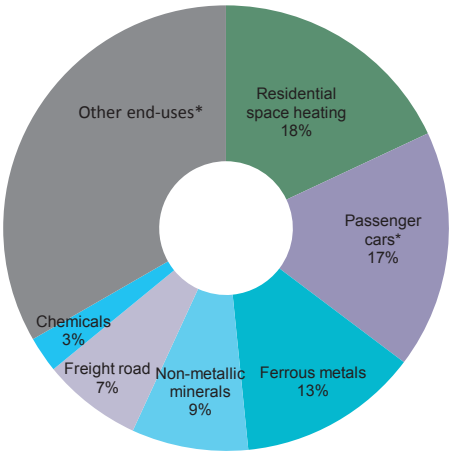
LUXEMBOURG

Cross-sectoral overview

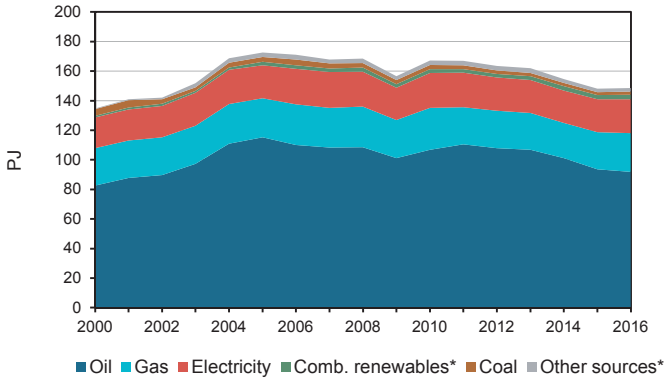
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

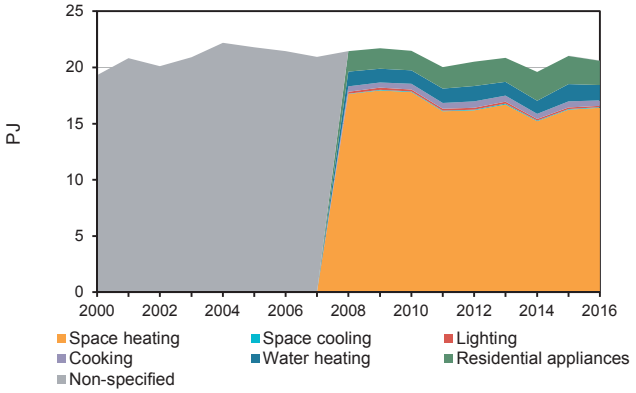
**Includes emissions reallocated from electricity and heat generation.

LUXEMBOURG

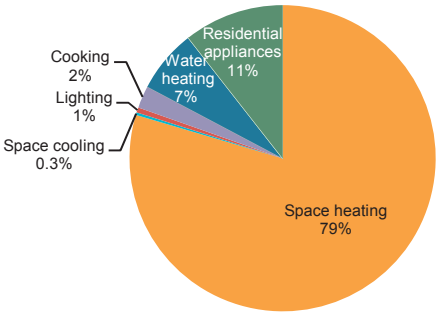
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	19	NA	0.4	44	119	3.7
2016	21	89	0.6	35	134	2.5

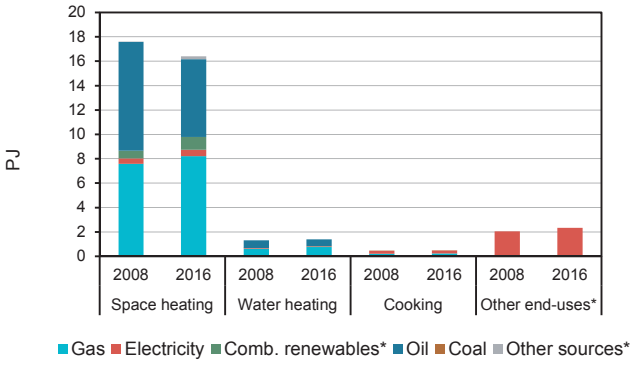
Residential energy consumption by end-use



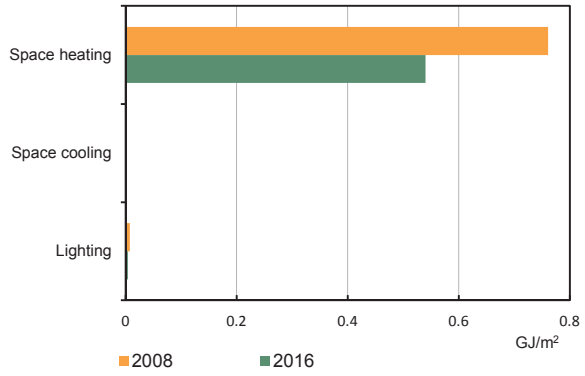
Residential energy consumption by end-use, 2016



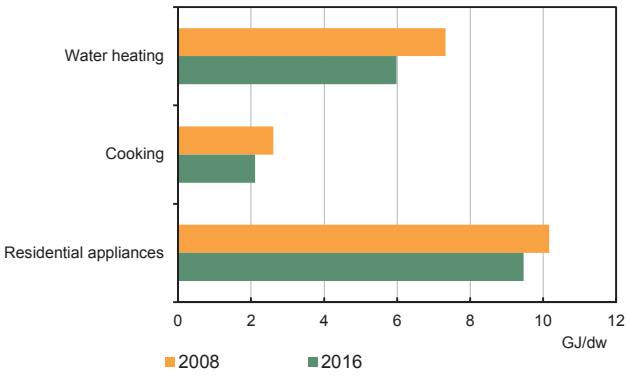
Residential energy consumption by source



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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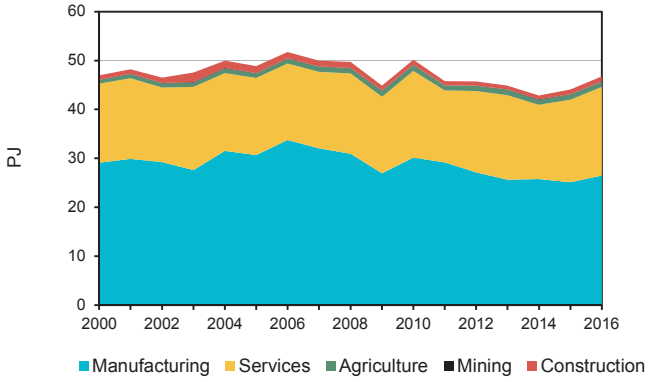
LUXEMBOURG

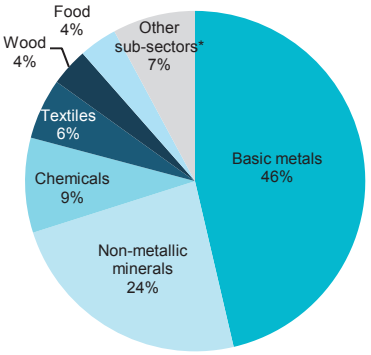
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	29	16	2	33	3	24
2016	27	18	2	52	3	39

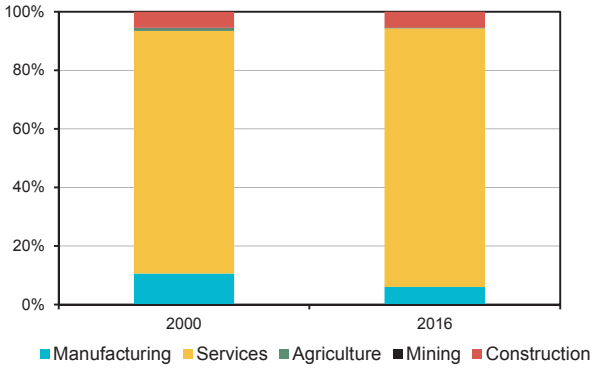
Industry and services energy consumption



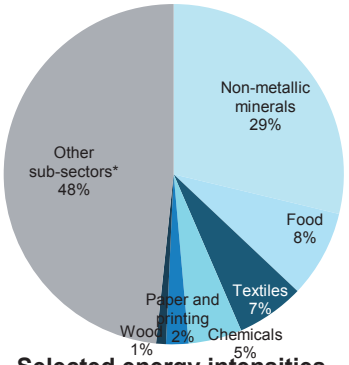
Manufacturing energy consumption by sub-sector, 2016



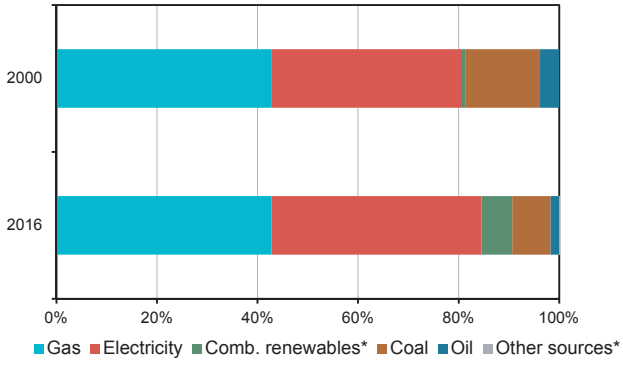
Value added** by sector



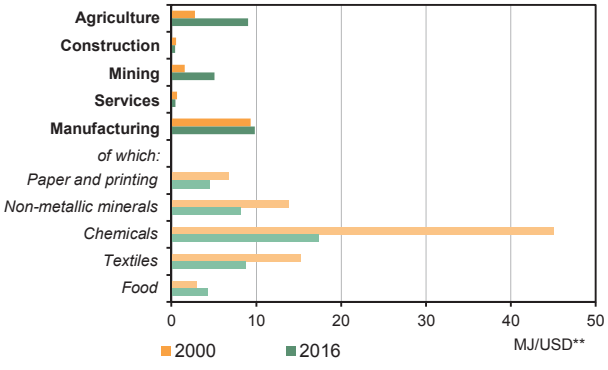
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



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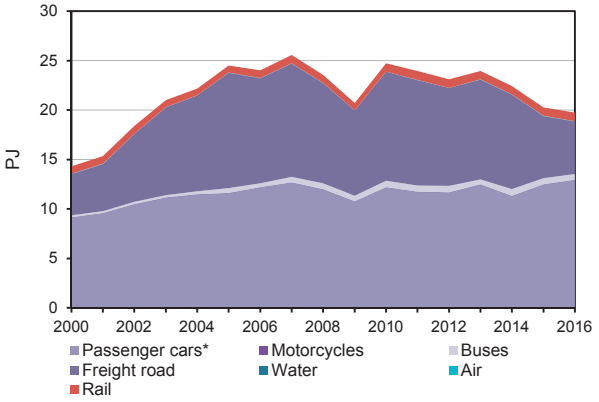
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

LUXEMBOURG

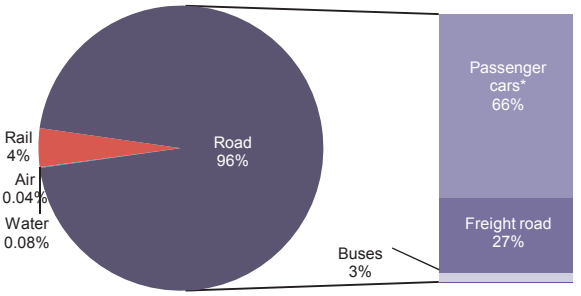
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	10	5	6	9	NA	NA
2016	14	6	9	7	1.2	10.7

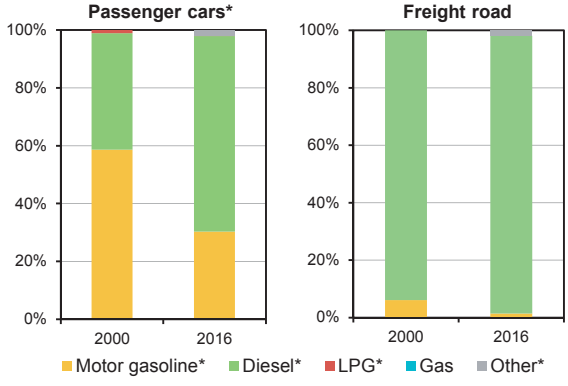
Transport energy consumption by mode/vehicle type



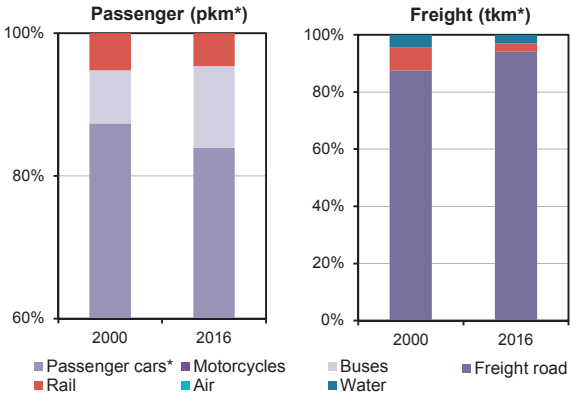
Transport energy consumption by mode/vehicle type, 2016



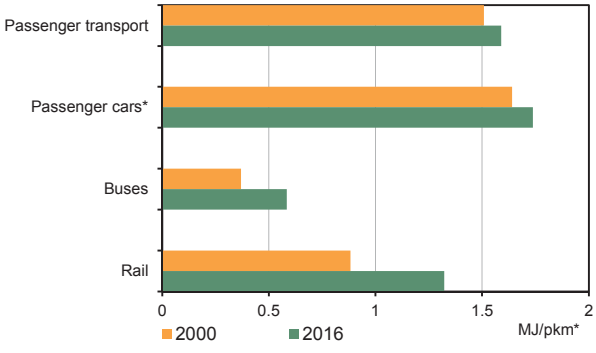
Energy consumption in road transport by source



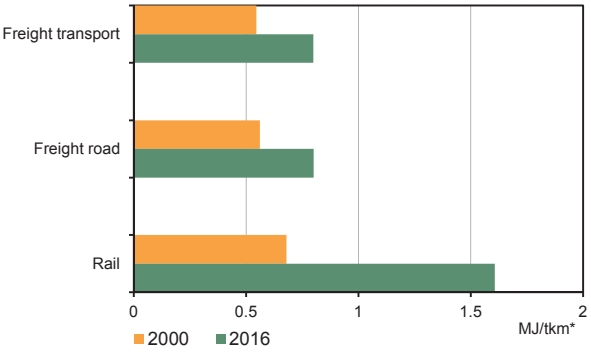
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport

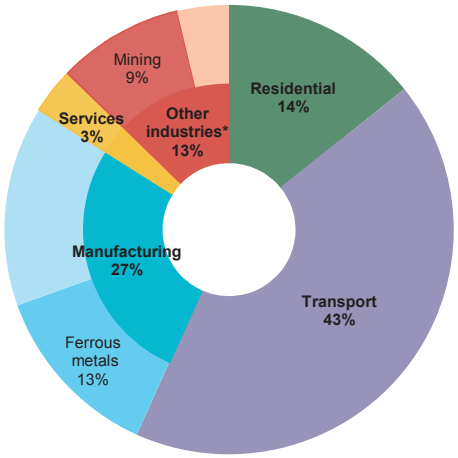


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

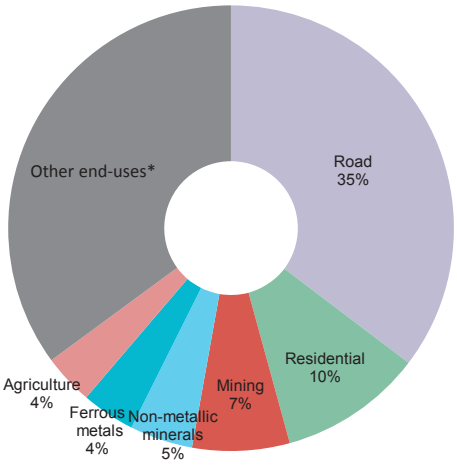
MEXICO

Cross-sectoral overview

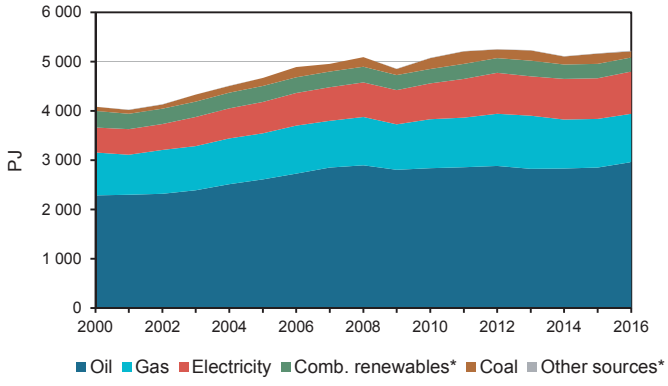
Largest end-uses by sector, 2016



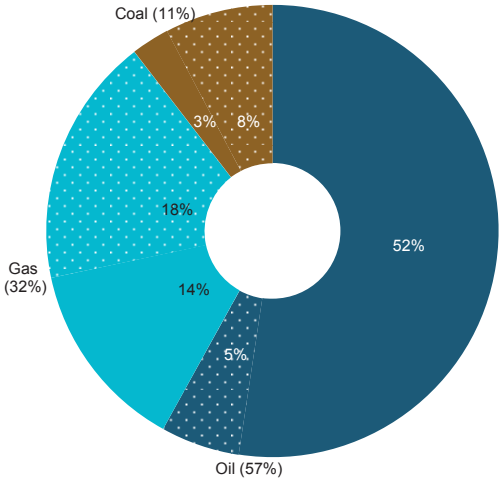
Top six CO_2 emitting sectors/subsectors, 2016**



Final energy consumption by source



Final energy emissions by source, 2016 **



*Other industries includes agriculture, mining and construction; other includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

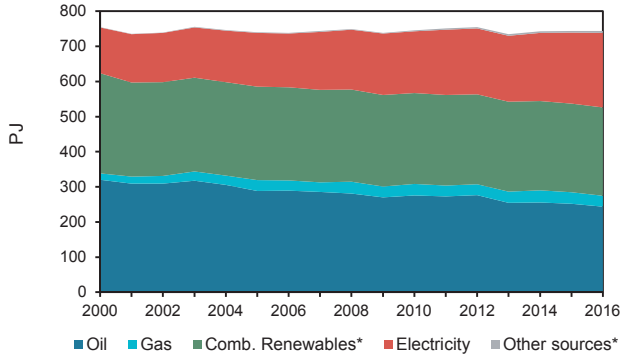
**Includes emissions reallocated from electricity and heat generation; transport emissions in these graphs are based on the IEA (2018) *CO_2 emissions from fuel combustion* database. Dotted shares represent indirect emissions from electricity and heat generation from respective fuels.

MEXICO

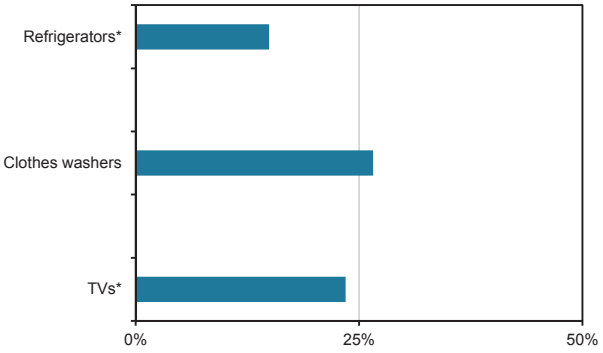
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in residential sector (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	755	45	101	7	67	4.4
2016	744	37	122	6	NA	3.7

Residential energy consumption



Appliances per dwelling, 2000-16 % change



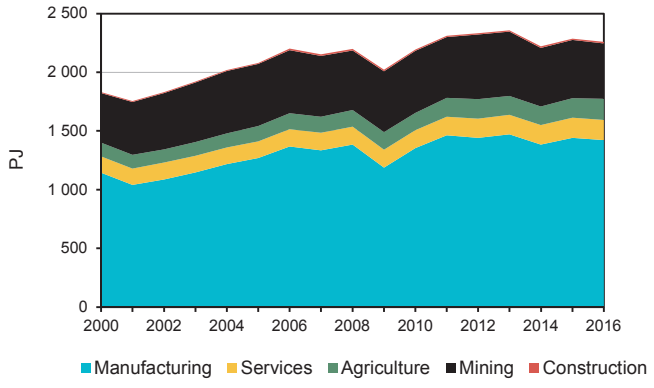
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

MEXICO

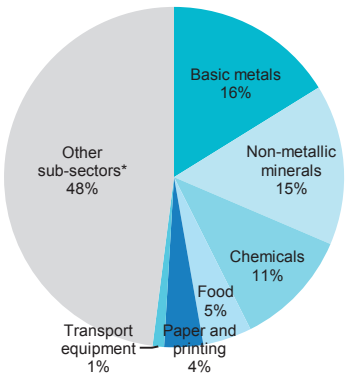
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	1 145	115	549	1 433	260	839
2016	1 421	141	665	2 036	311	1 301

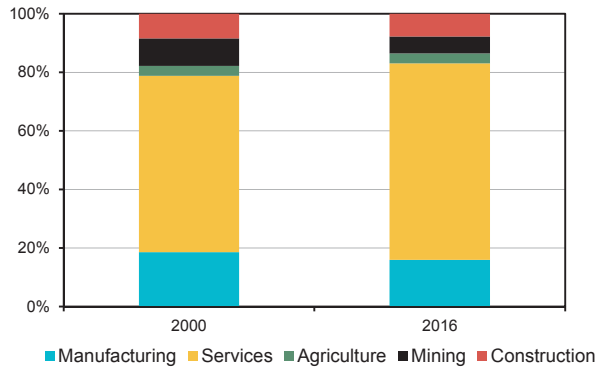
Industry and services energy consumption



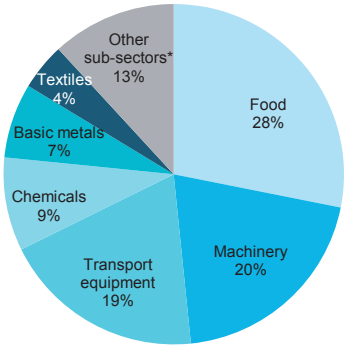
Manufacturing energy consumption by sub-sector, 2016



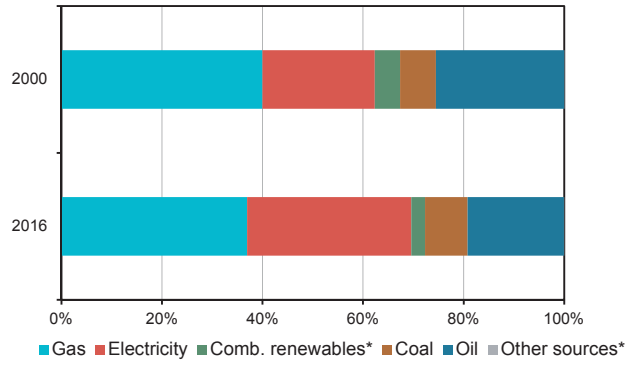
Value added** by sector



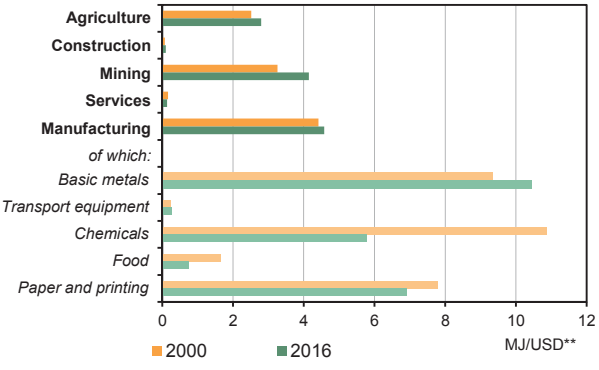
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



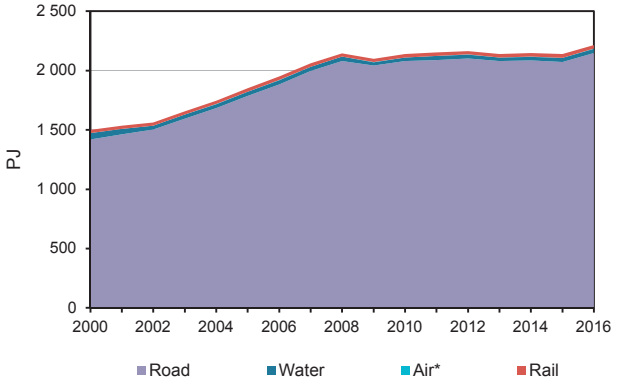
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

MEXICO

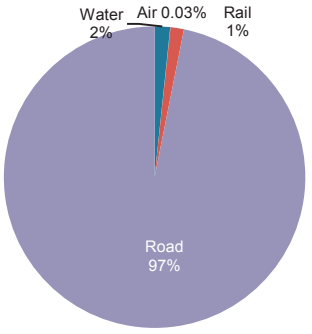
Transport* sector

	Transport sector consumption (PJ)	Transport sector emissions (MtCO2)	Passenger cars stock* (million)	Trucks stock (million)
2000	1 501	106	10	5
2016	2 217	156	29	10

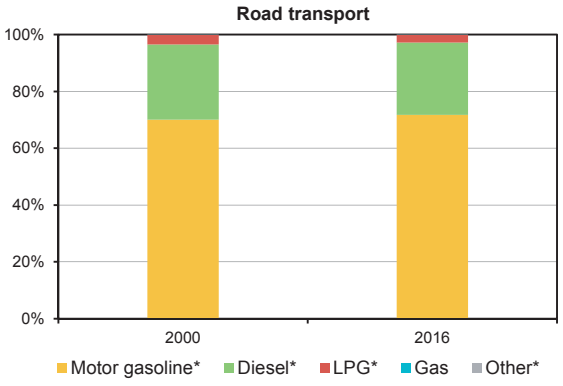
Transport energy consumption by mode/vehicle type**



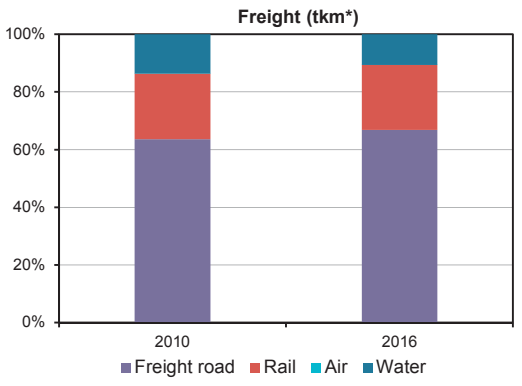
Transport energy consumption by mode/vehicle type**, 2016



Energy consumption in road transport by source



Transport activity by mode/vehicle type



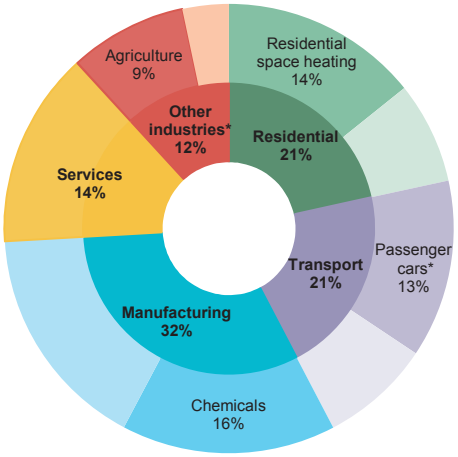
*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources. Energy consumption for air transport includes only aviation gasoline.

** Transport energy consumption in these graphs are based in the IEA (2018) *World energy balances* database.

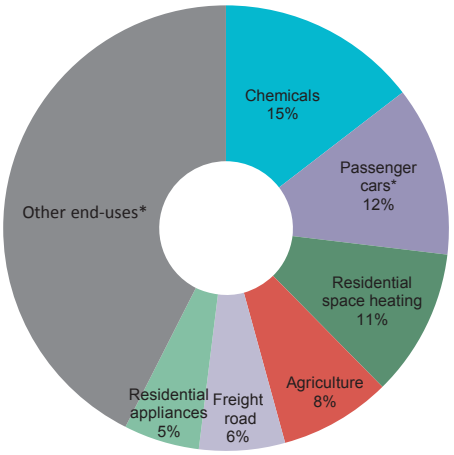
NETHERLANDS

Cross-sectoral overview

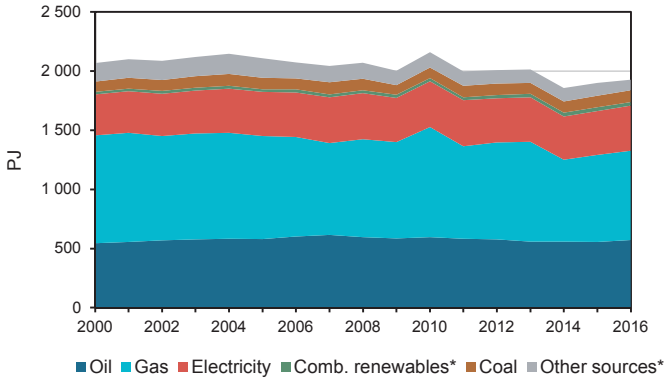
Largest end-uses by sector, 2016



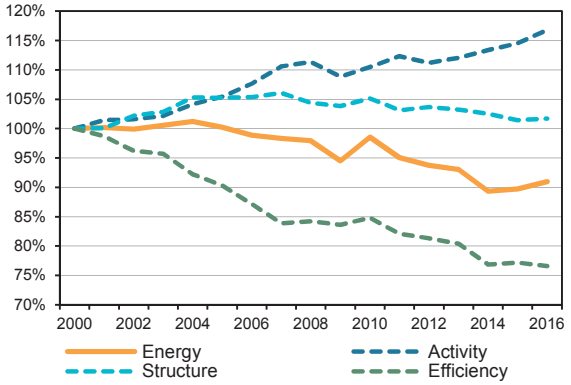
Top six CO_2 emitting end-uses, 2016**



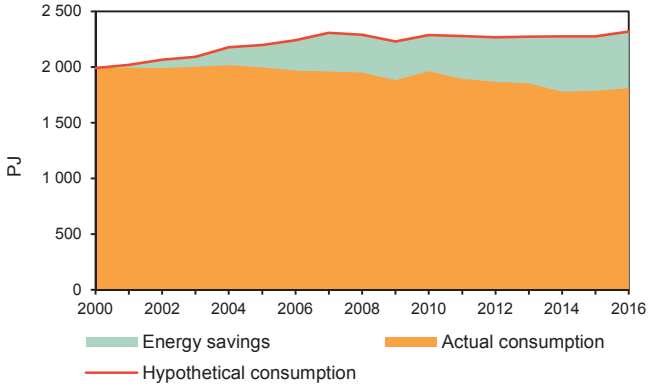
Final energy consumption by source



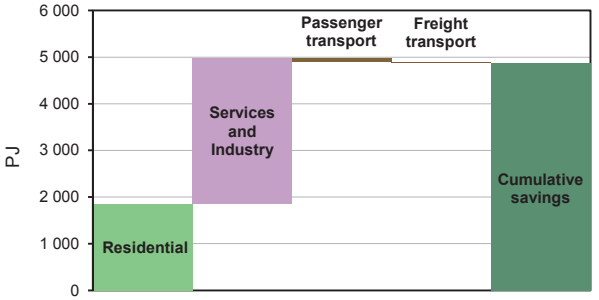
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

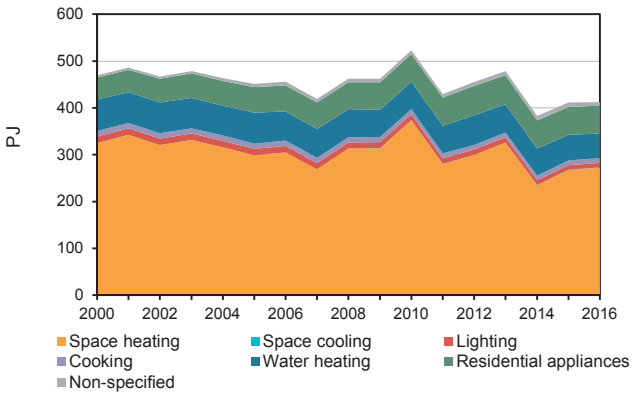
***These figures display results from the IEA decomposition analysis and cover approximately 96% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

NETHERLANDS

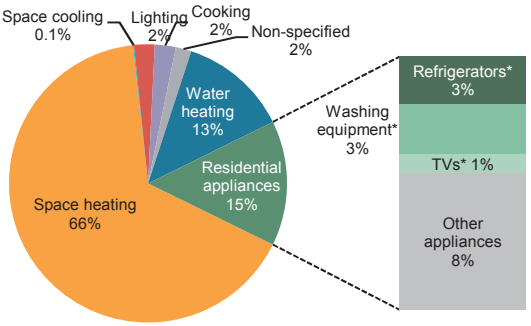
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	470	93	16	29	106	2.4
2016	412	89	17	24	119	2.3

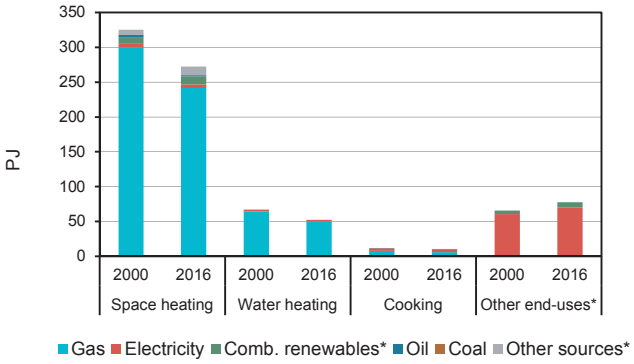
Residential energy consumption by end-use



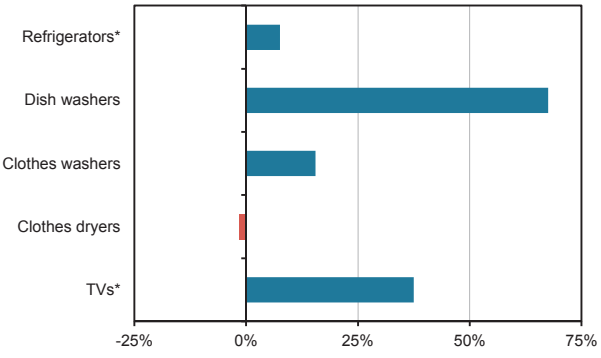
Residential energy consumption by end-use, 2016



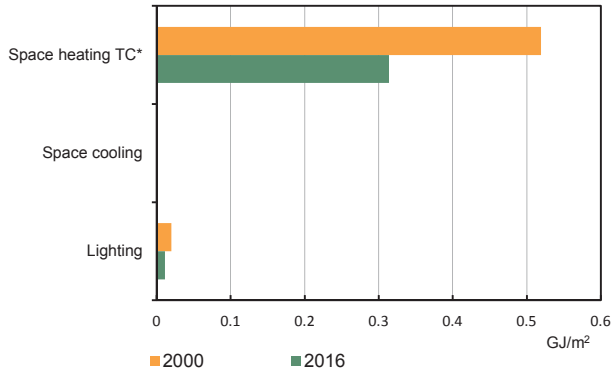
Residential energy consumption by source



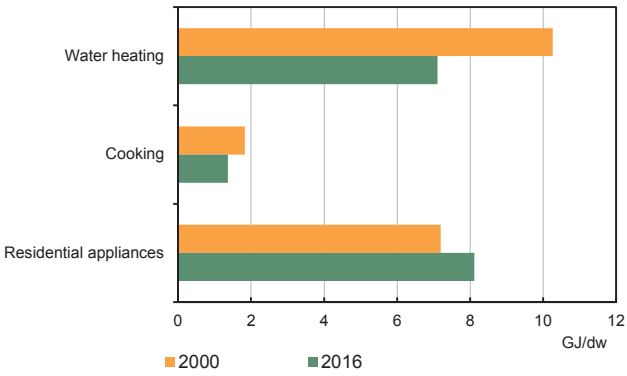
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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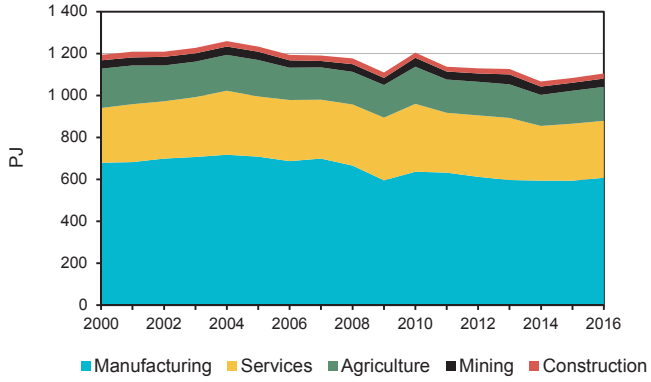
NETHERLANDS

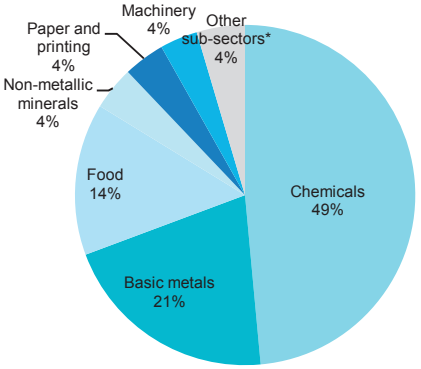
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	679	261	254	651	73	429
2016	608	270	226	788	83	555

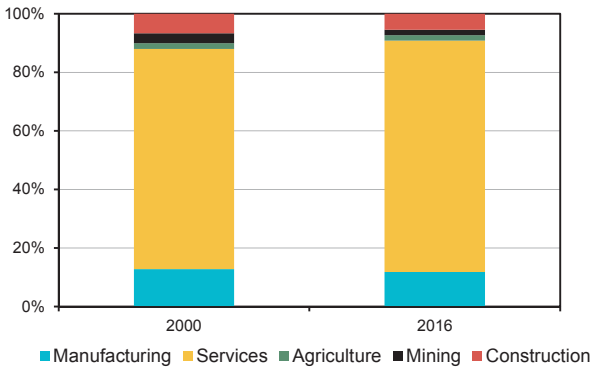
Industry and services energy consumption



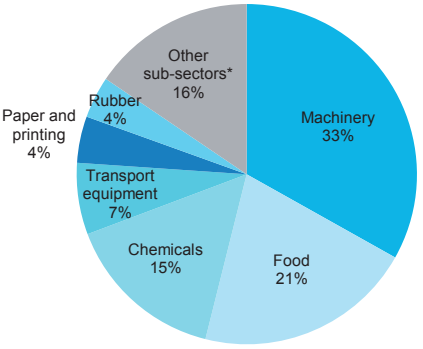
Manufacturing energy consumption by sub-sector, 2016



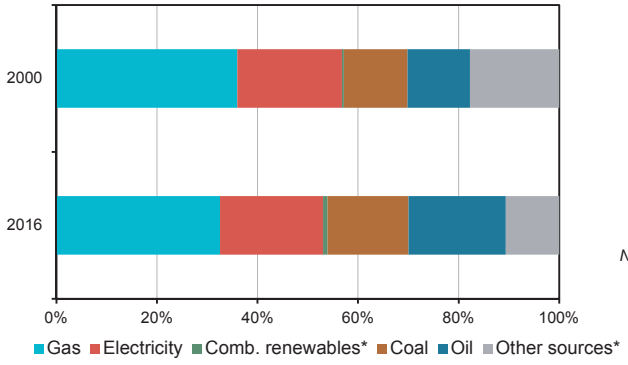
Value added** by sector



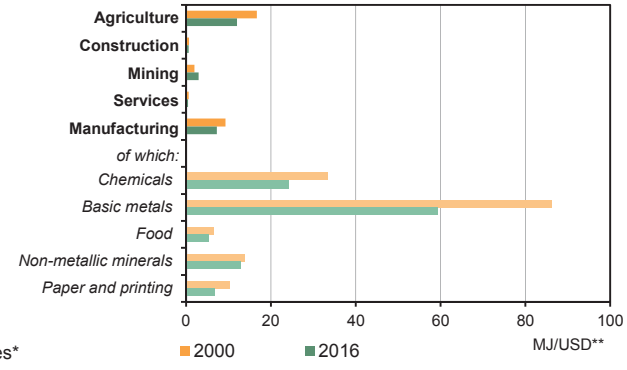
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



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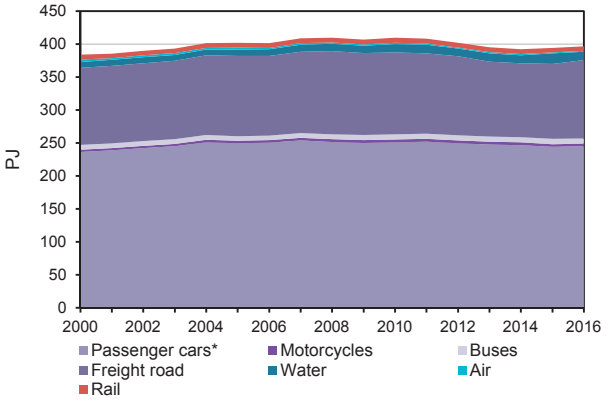
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

NETHERLANDS

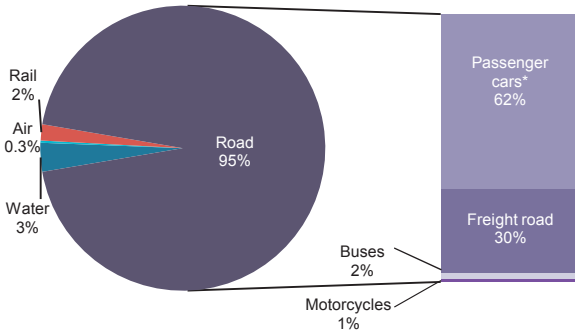
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	256	128	169	92	1.6	2.0
2016	263	134	170	105	1.3	2.1

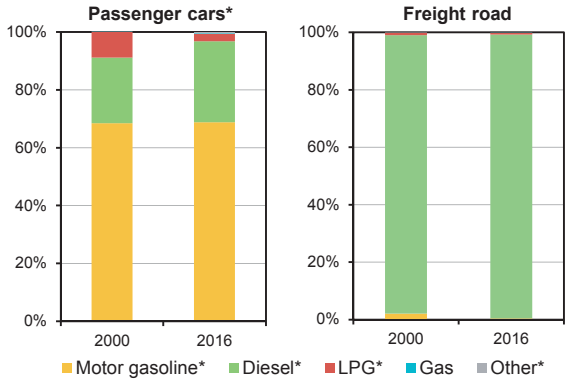
Transport energy consumption by mode/vehicle type



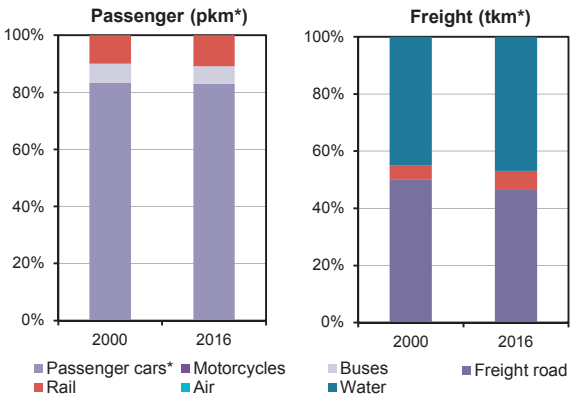
Transport energy consumption by mode/vehicle type, 2016



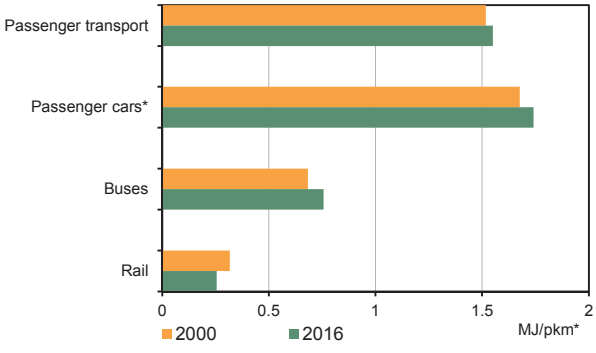
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



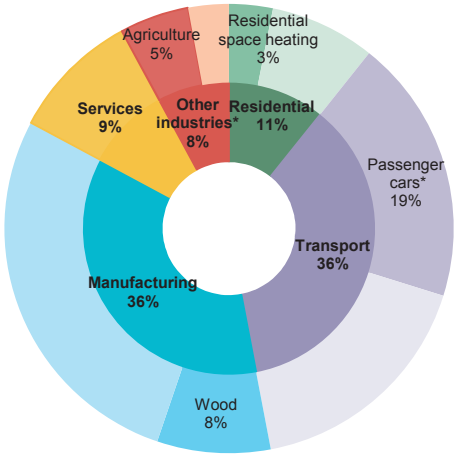
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

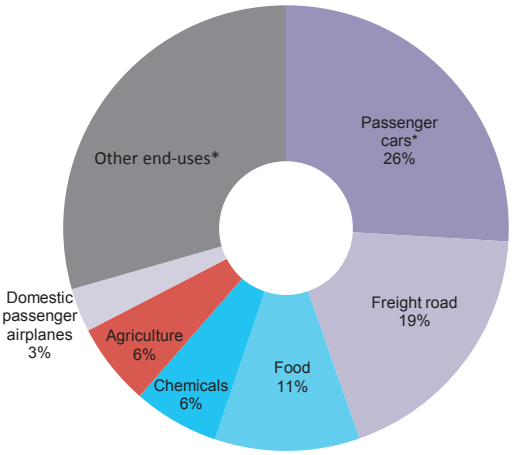
NEW ZEALAND

Cross-sectoral overview

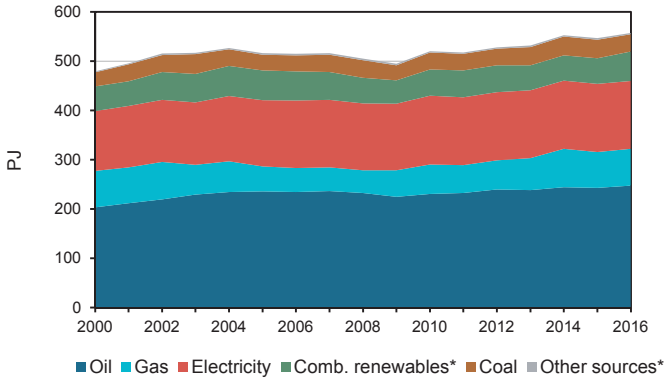
Largest end-uses by sector, 2016



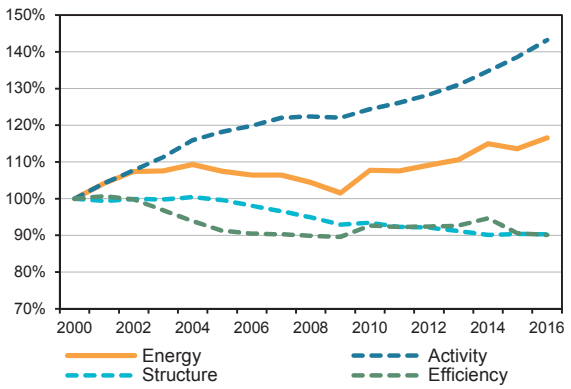
Top six CO_2 emitting end-uses, 2016**



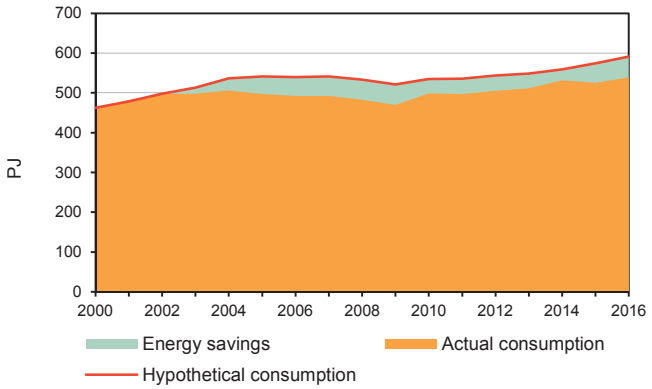
Final energy consumption by source



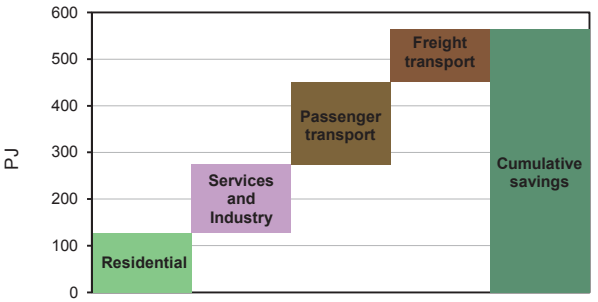
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

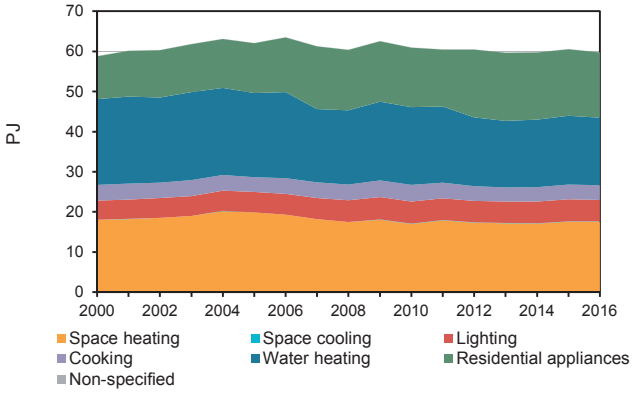
***These figures display results from the IEA decomposition analysis and cover approximately 96% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

NEW ZEALAND

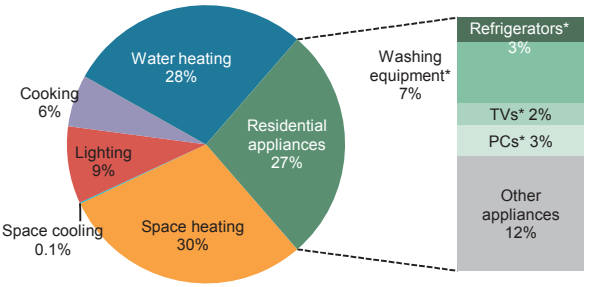
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	59	31	4	15	120	2.7
2016	60	31	5	13	134	2.7

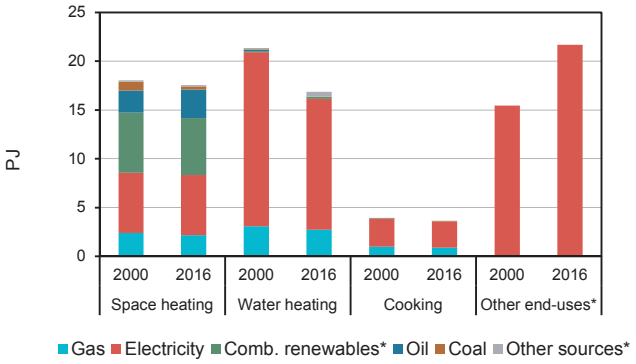
Residential energy consumption by end-use



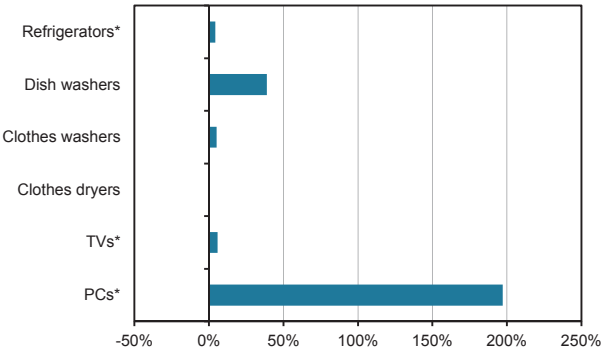
Residential energy consumption by end-use, 2016



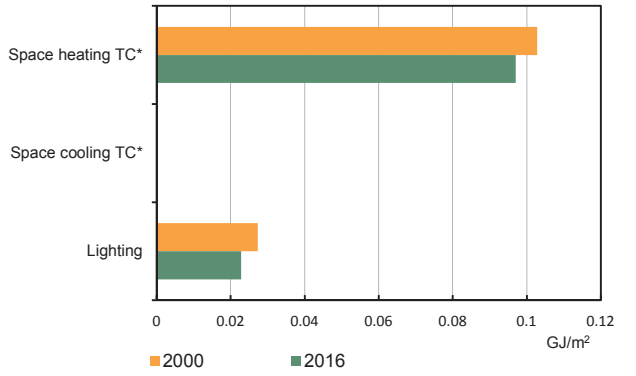
Residential energy consumption by source



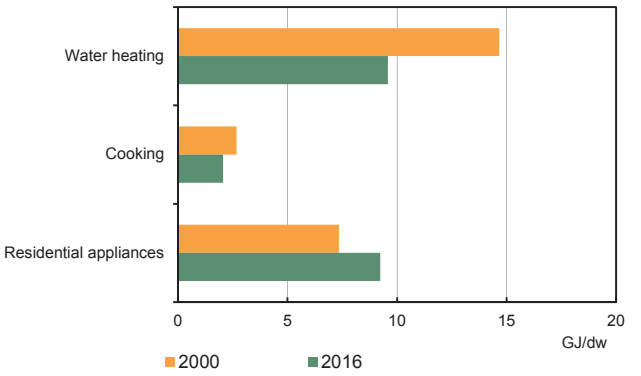
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



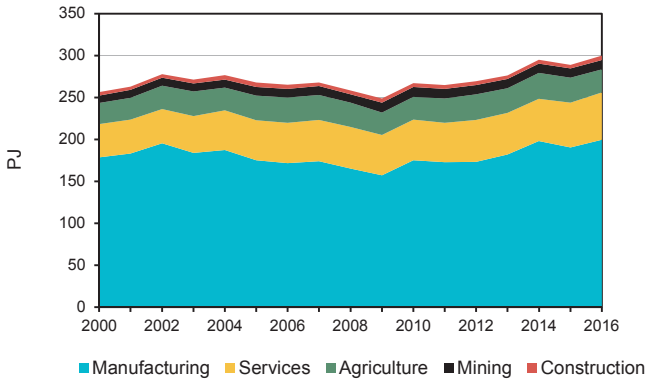
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

NEW ZEALAND

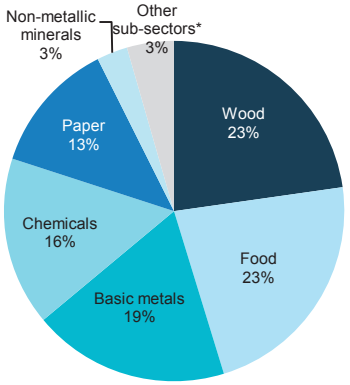
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	179	39	38	104	15	64
2016	199	51	44	160	16	104

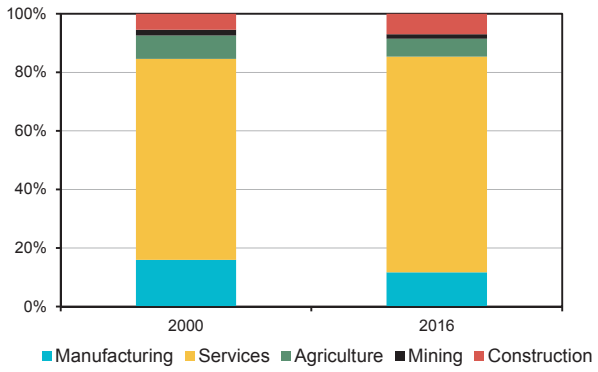
Industry and services energy consumption



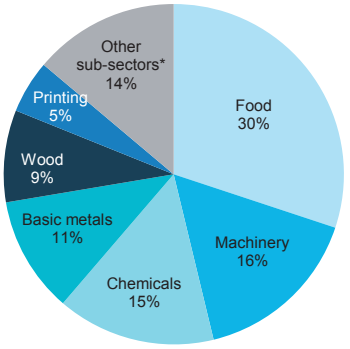
Manufacturing energy consumption by sub-sector, 2016



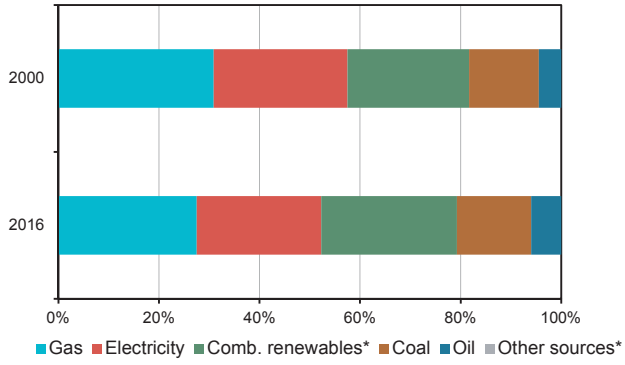
Value added** by sector



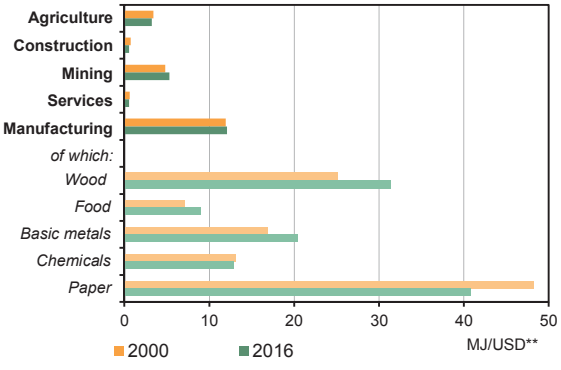
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



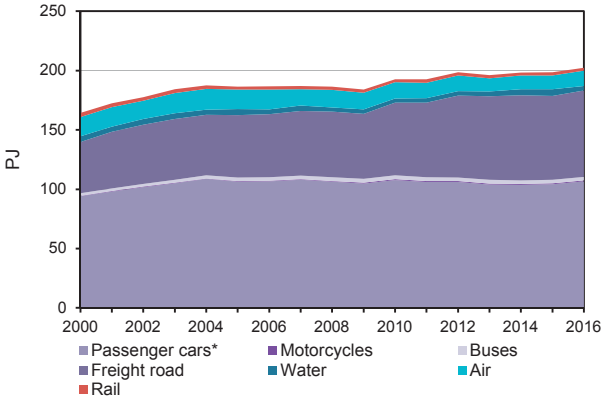
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

NEW ZEALAND

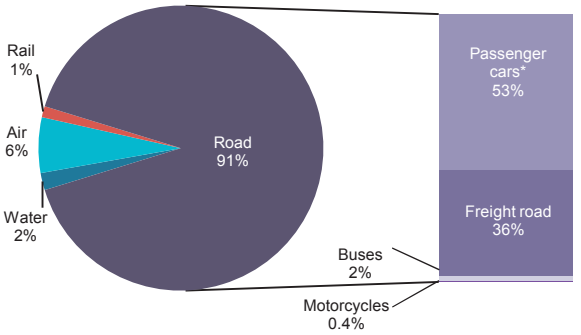
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	113	51	51	25	1.7	2.4
2016	124	79	67	40	1.6	2.9

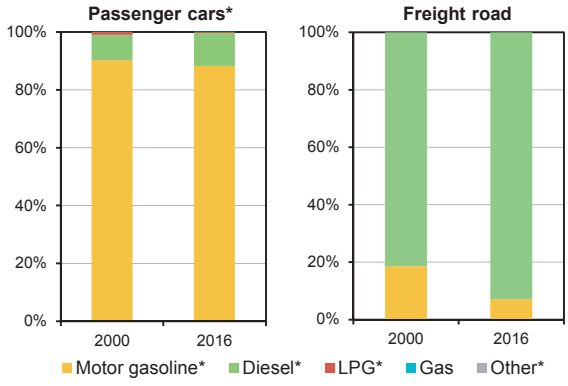
Transport energy consumption by mode/vehicle type



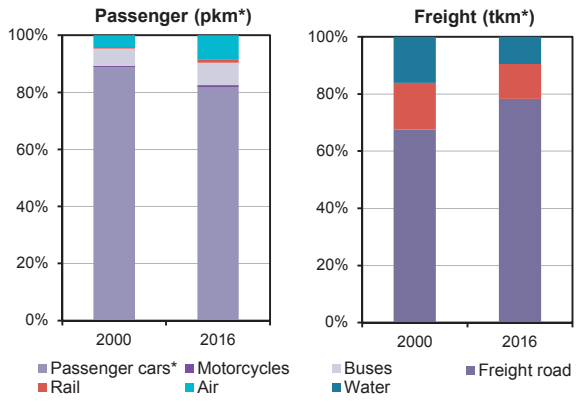
Transport energy consumption by mode/vehicle type, 2016



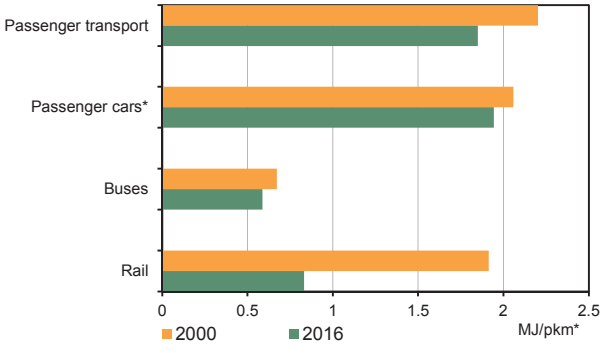
Energy consumption in road transport by source



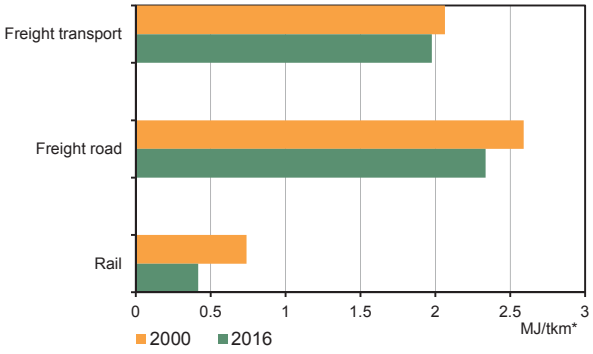
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport

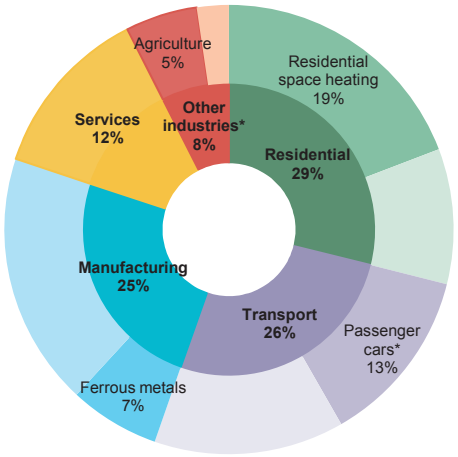


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

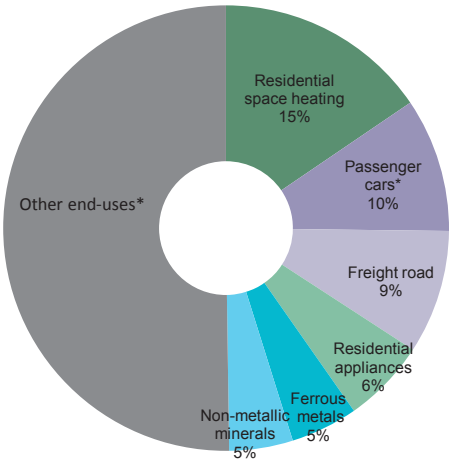
POLAND

Cross-sectoral overview

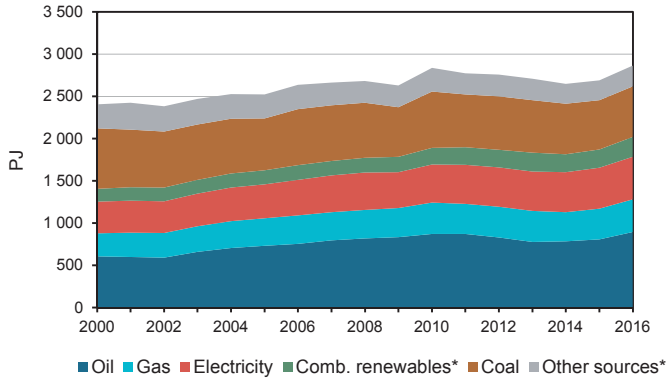
Largest end-uses by sector, 2016



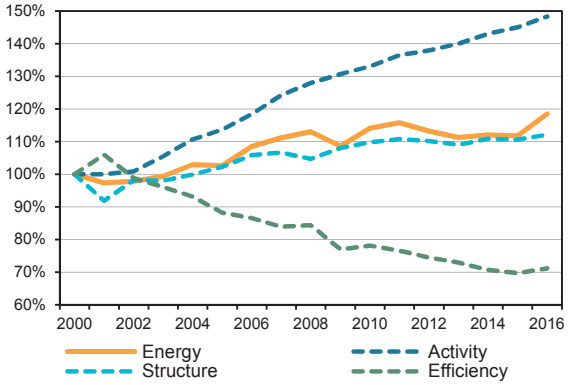
Top six CO_2 emitting end-uses, 2016**



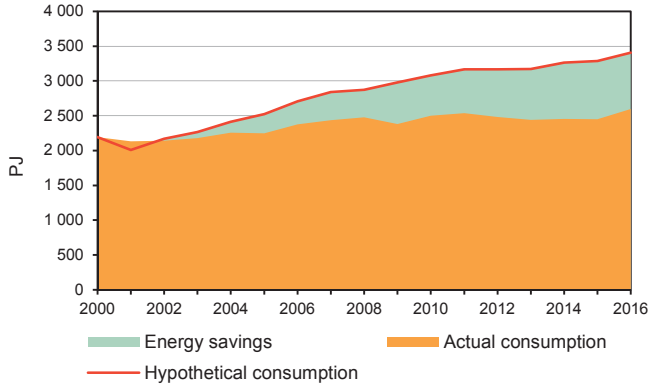
Final energy consumption by source



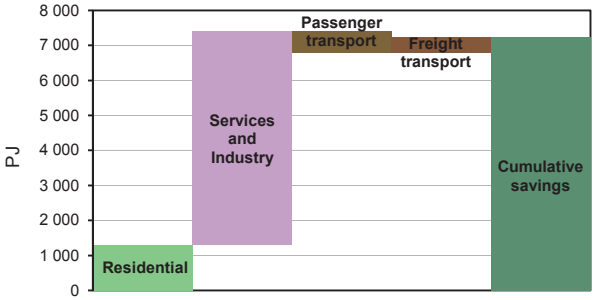
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



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**Includes emissions reallocated from electricity and heat generation.

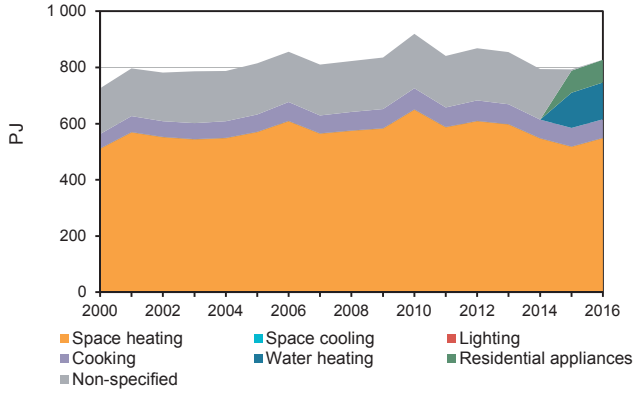
***These figures display results from the IEA decomposition analysis and cover approximately 90% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

POLAND

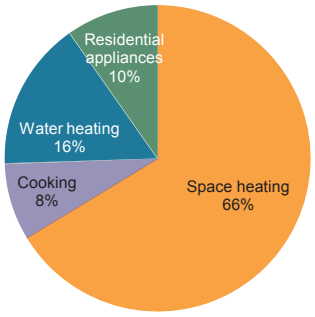
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	726	50	38	19	67	3.2
2016	828	60	38	22	74	2.7

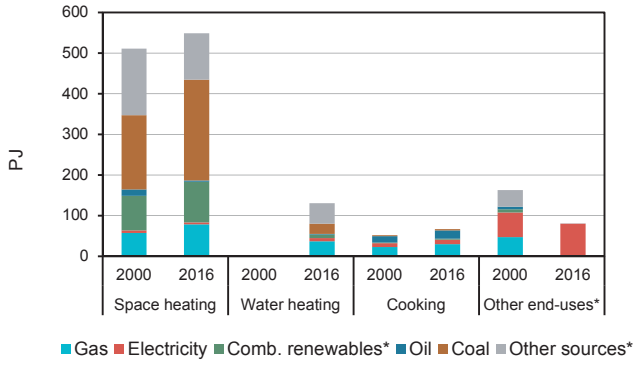
Residential energy consumption by end-use



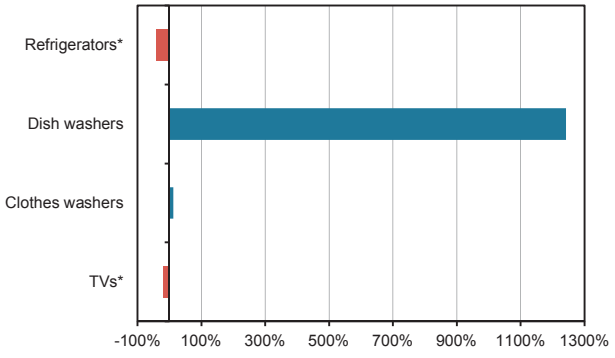
Residential energy consumption by end-use, 2016



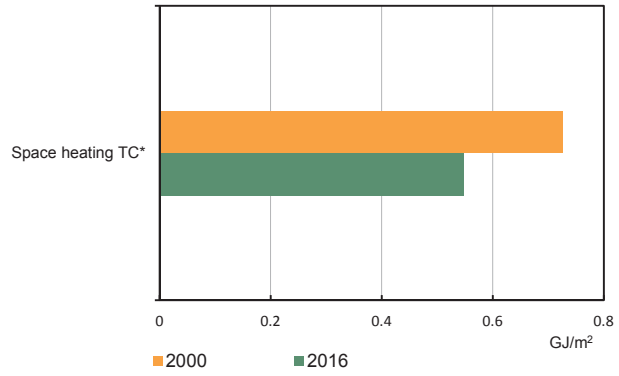
Residential energy consumption by source



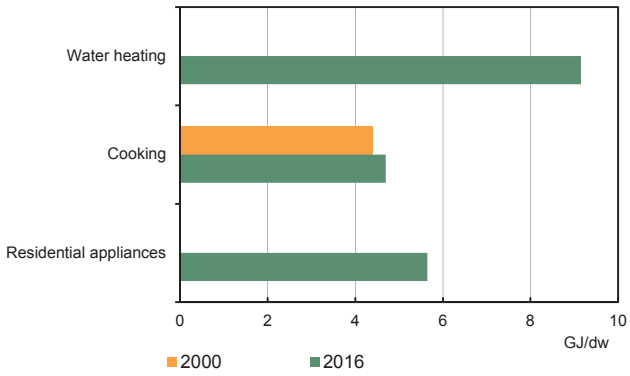
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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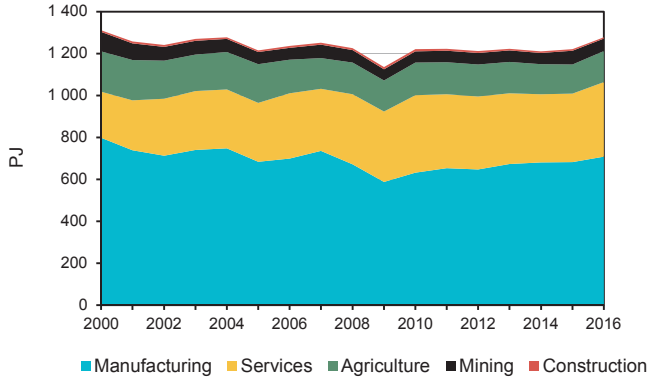
POLAND

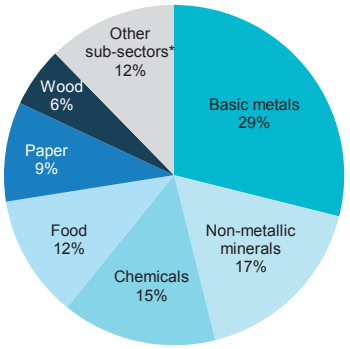
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	798	220	293	546	39	322
2016	708	356	214	958	150	514

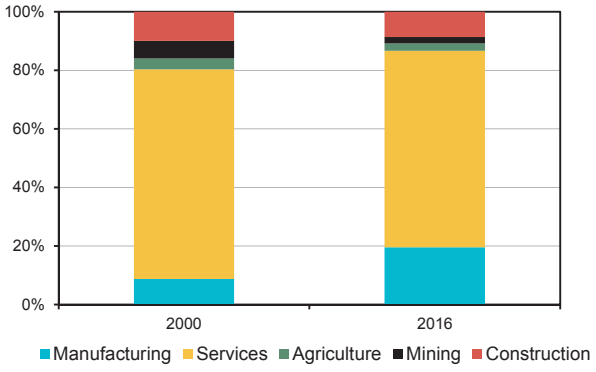
Industry and services energy consumption



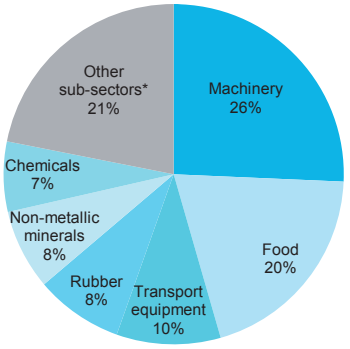
Manufacturing energy consumption by sub-sector, 2016



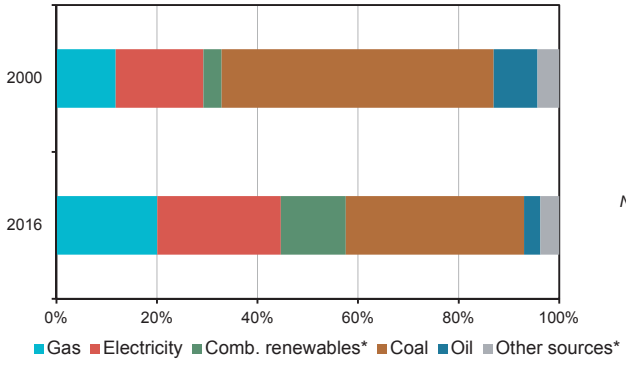
Value added** by sector



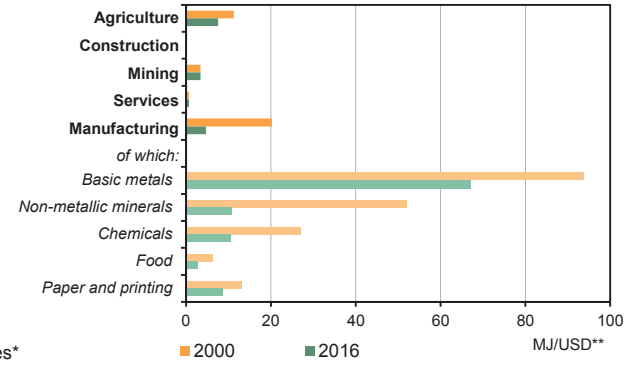
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



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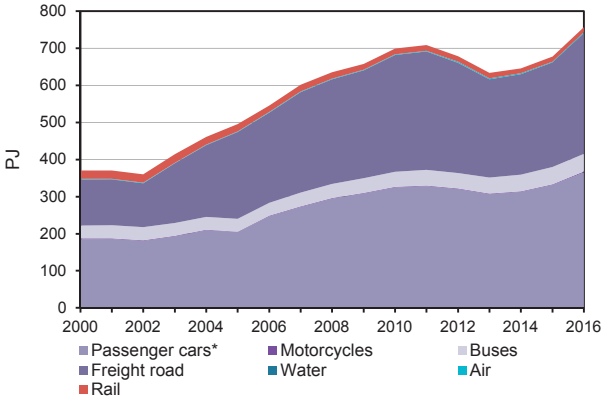
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

POLAND

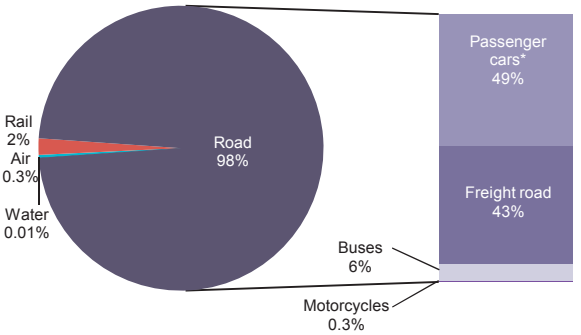
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	229	141	191	131	1.9	NA
2016	421	337	247	354	NA	NA

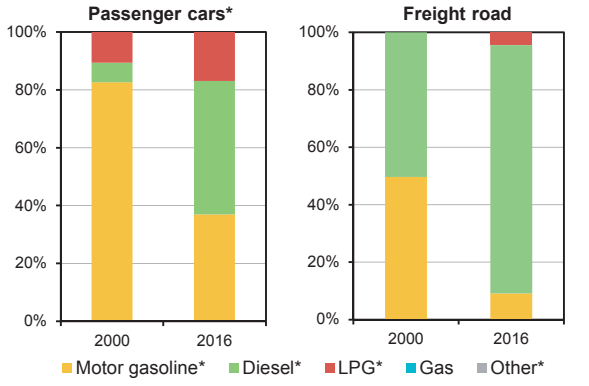
Transport energy consumption by mode/vehicle type



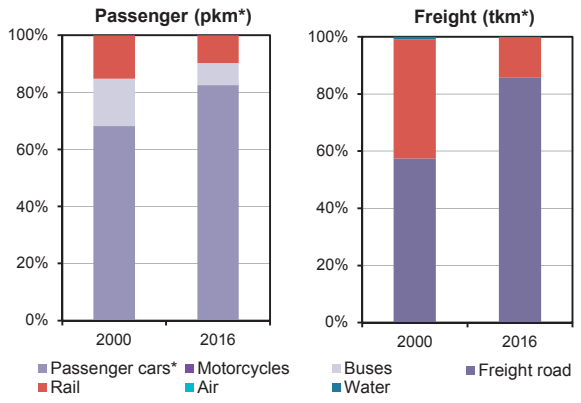
Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport

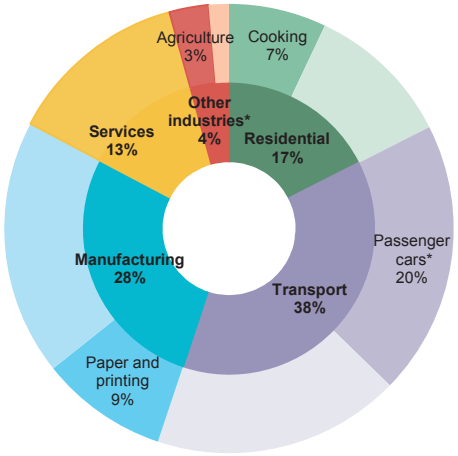
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

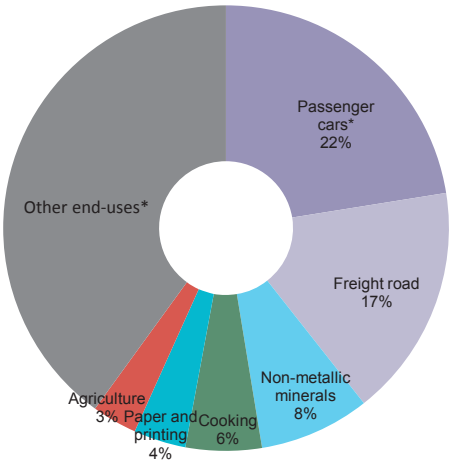
PORTUGAL

Cross-sectoral overview

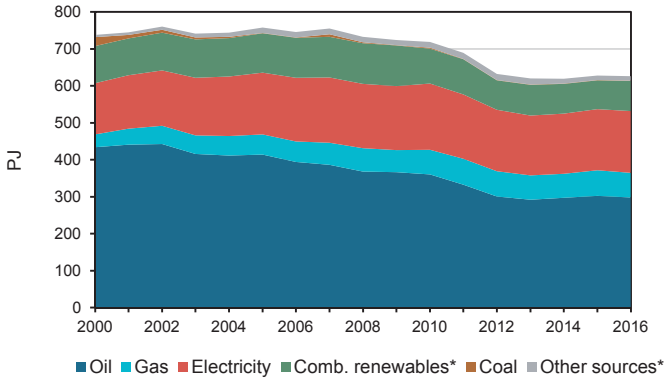
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

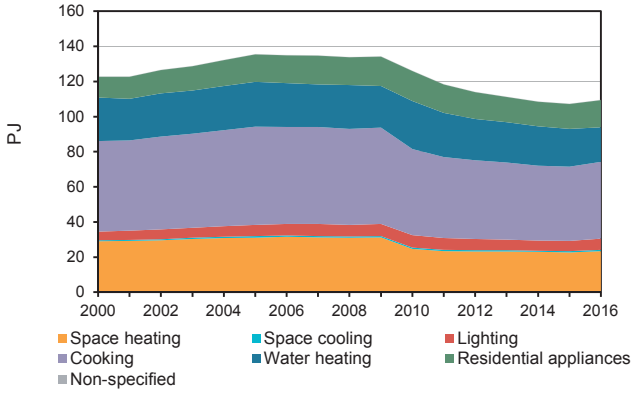
**Includes emissions reallocated from electricity and heat generation.

PORTUGAL

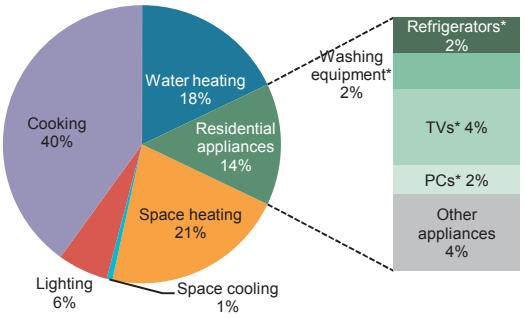
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	123	4	10	12	86	3.1
2016	109	9	10	11	101	2.6

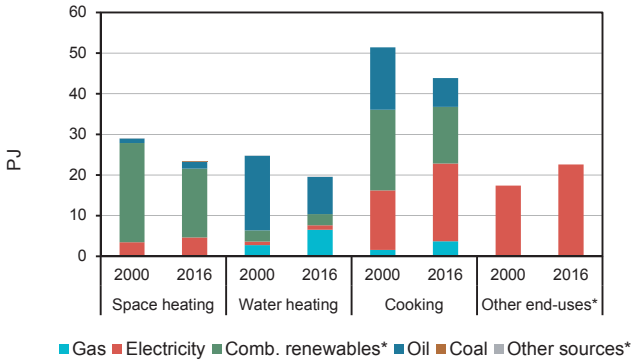
Residential energy consumption by end-use



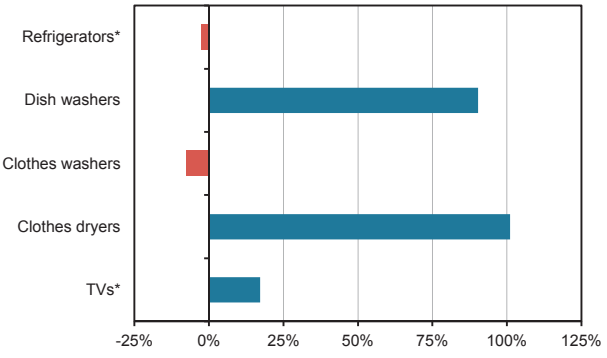
Residential energy consumption by end-use, 2016



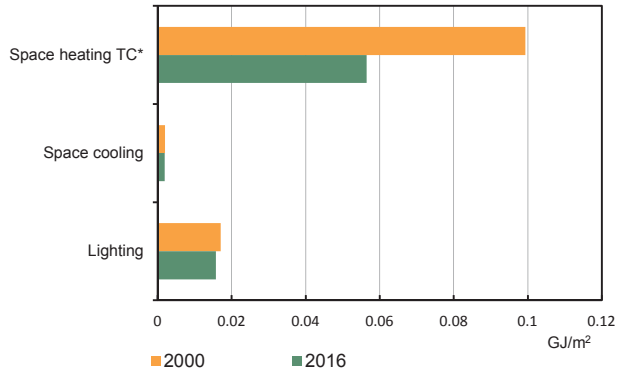
Residential energy consumption by source



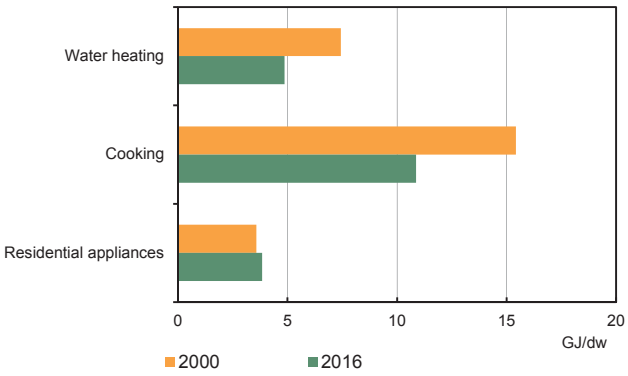
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



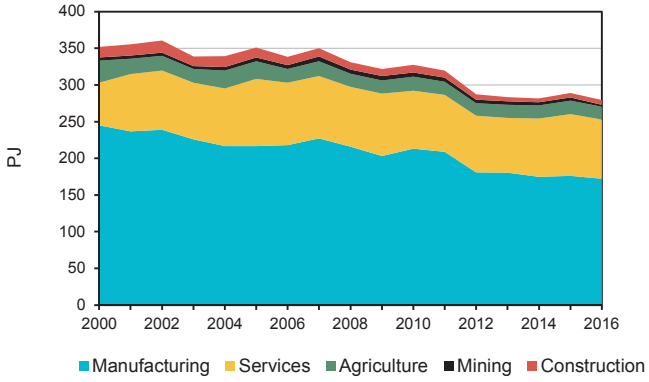
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

PORTUGAL

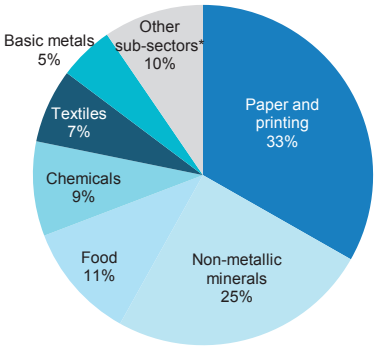
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	245	54	49	269	35	162
2016	172	76	27	281	35	191

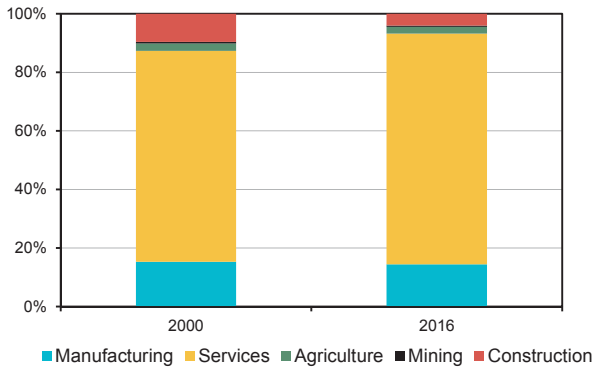
Industry and services energy consumption



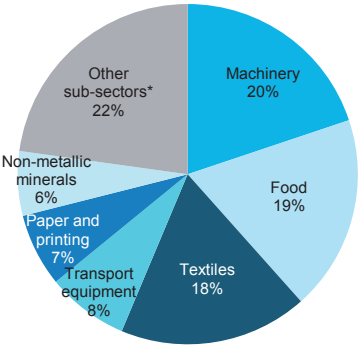
Manufacturing energy consumption by sub-sector, 2016



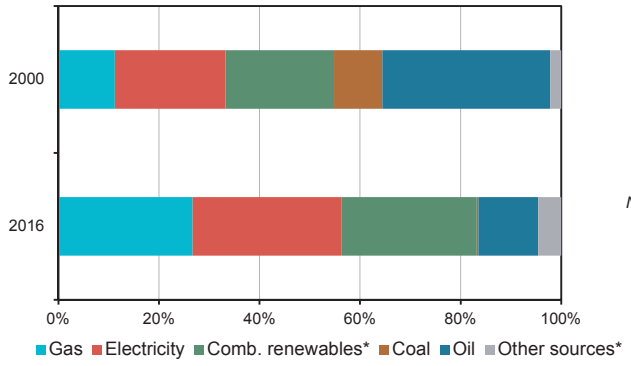
Value added** by sector



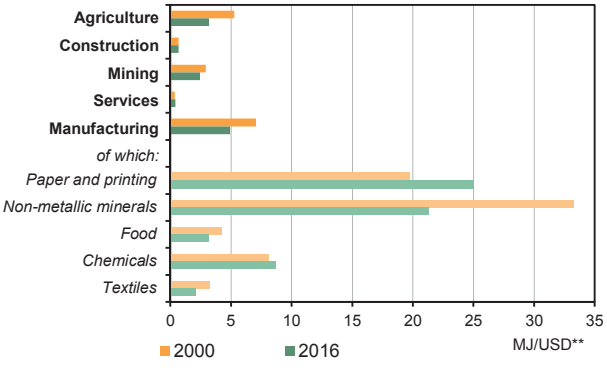
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



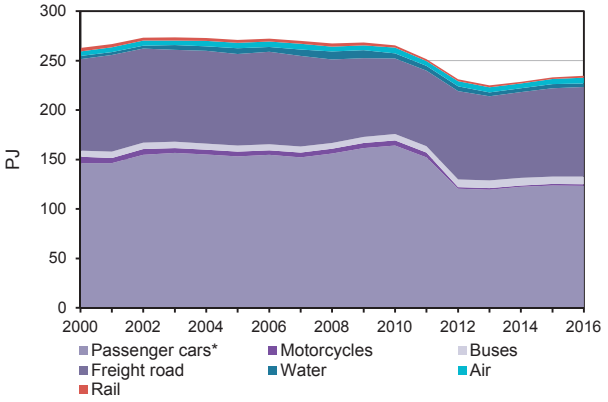
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

PORTUGAL

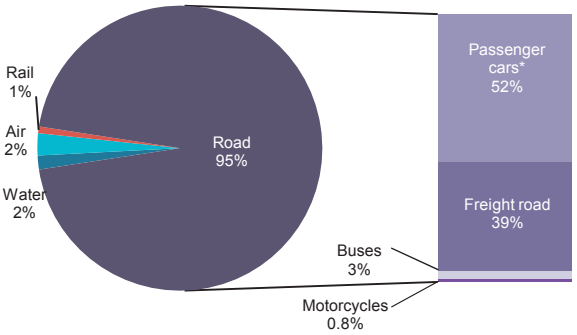
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	166	97	94	41	1.5	2.0
2016	140	95	99	37	1.8	1.9

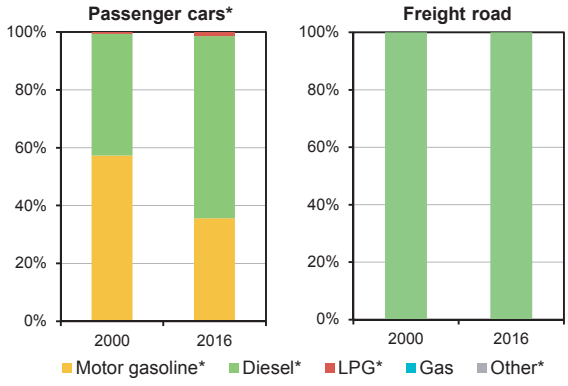
Transport energy consumption by mode/vehicle type



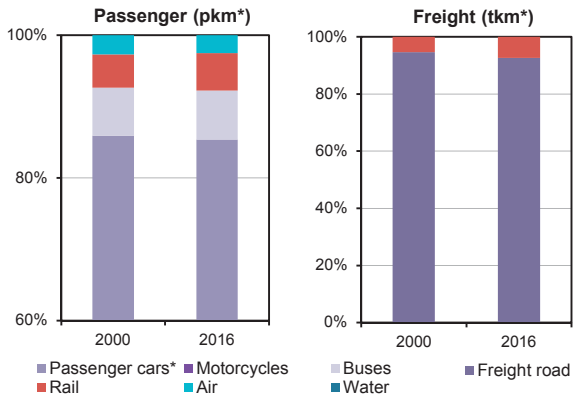
Transport energy consumption by mode/vehicle type, 2016



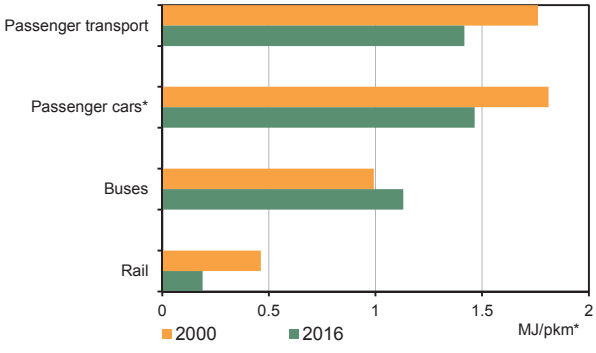
Energy consumption in road transport by source



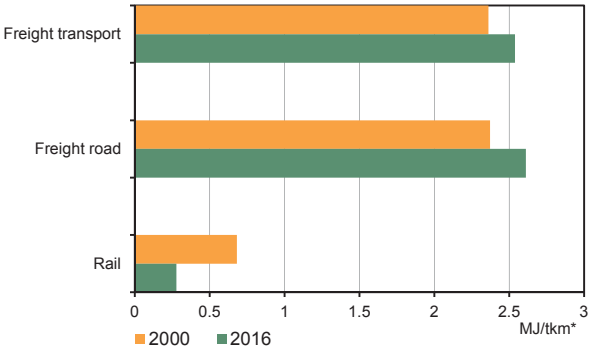
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport

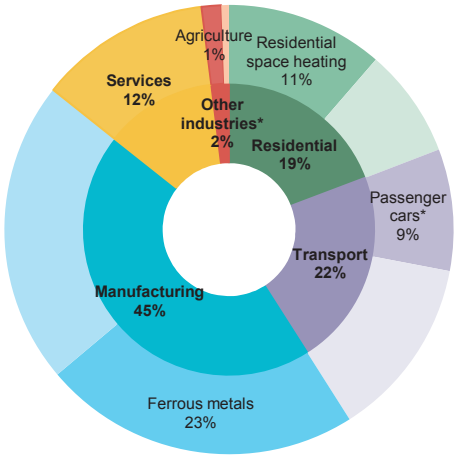


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

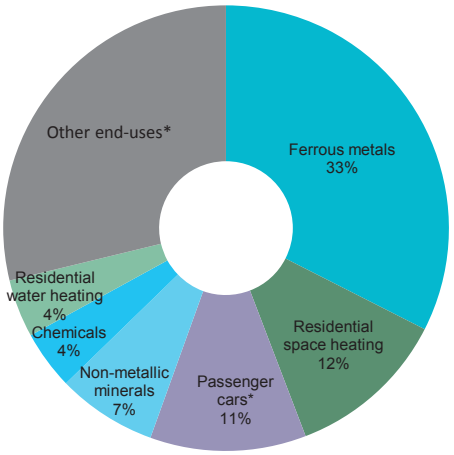
SLOVAK REPUBLIC

Cross-sectoral overview

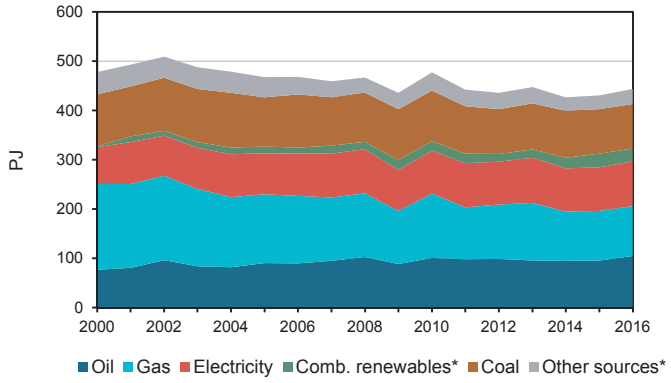
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

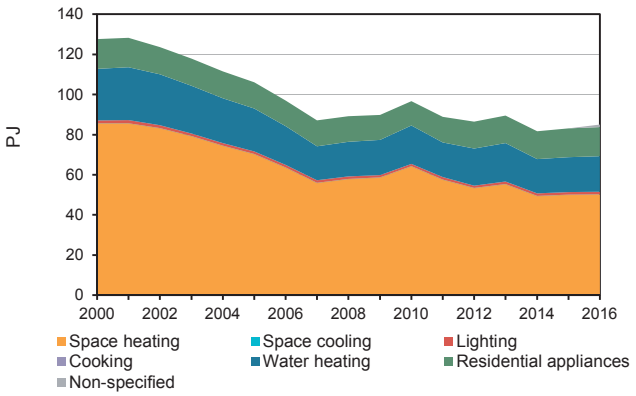
**Includes emissions reallocated from electricity and heat generation.

SLOVAK REPUBLIC

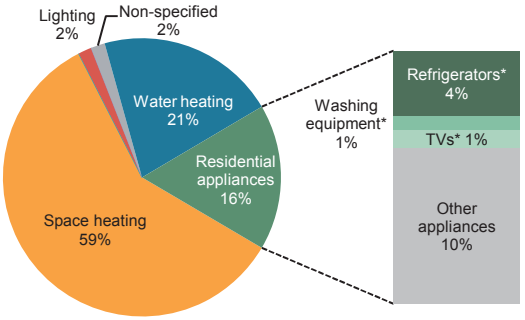
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	128	67	5	24	82	3.3
2016	85	72	5	16	86	3.1

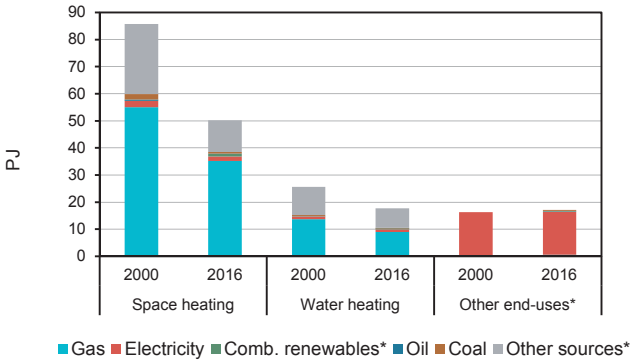
Residential energy consumption by end-use



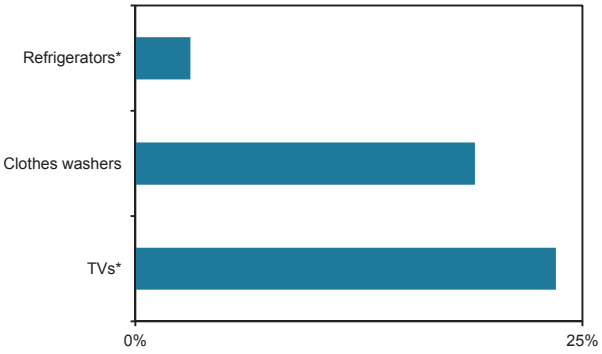
Residential energy consumption by end-use, 2016



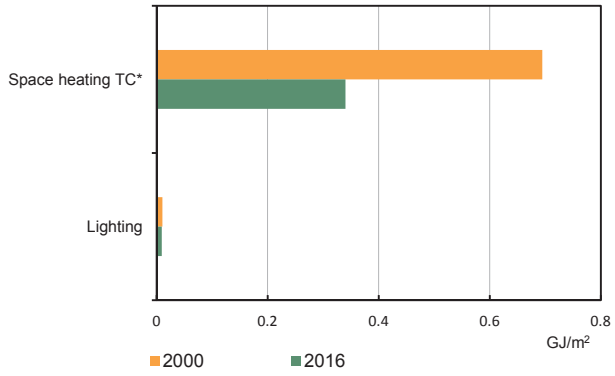
Residential energy consumption by source



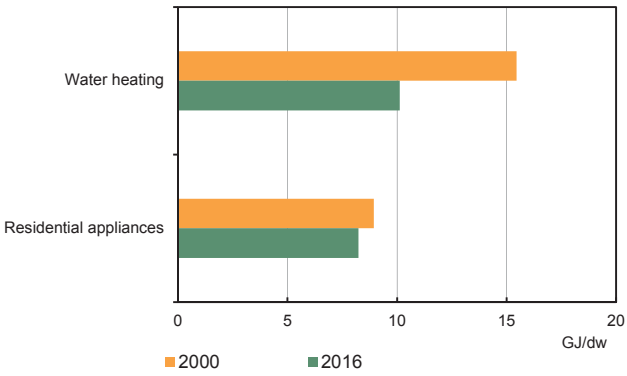
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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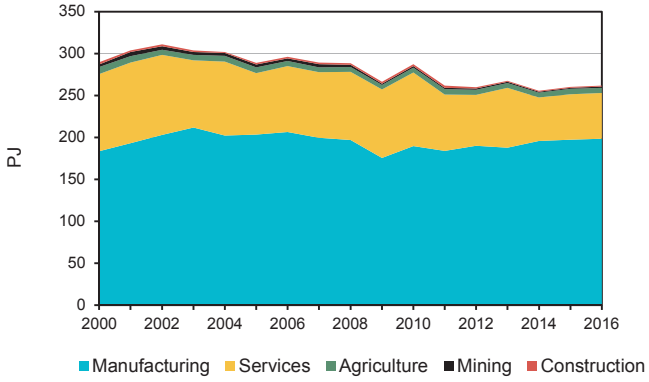
SLOVAK REPUBLIC

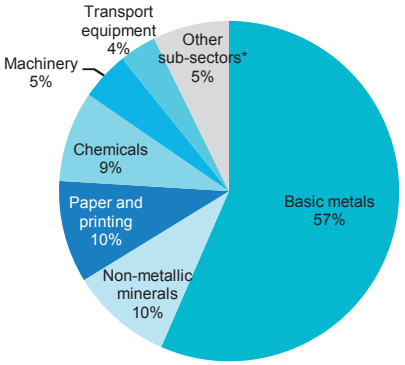
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	183	92	14	84	9	54
2016	198	55	9	158	34	83

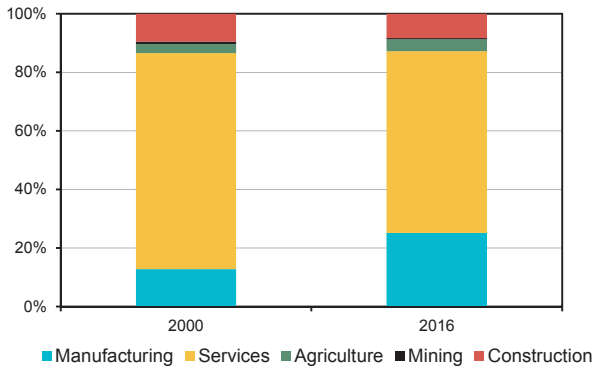
Industry and services energy consumption



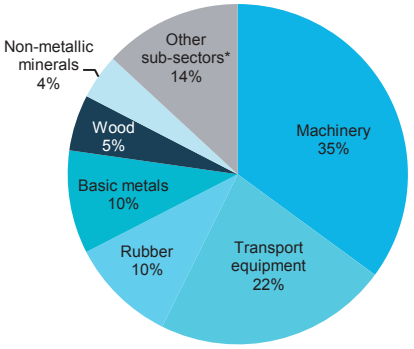
Manufacturing energy consumption by sub-sector, 2016



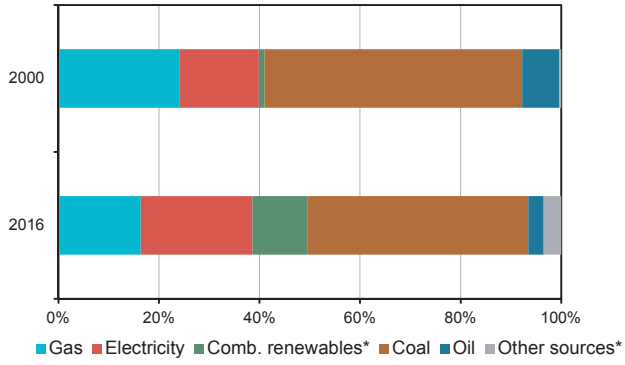
Value added** by sector



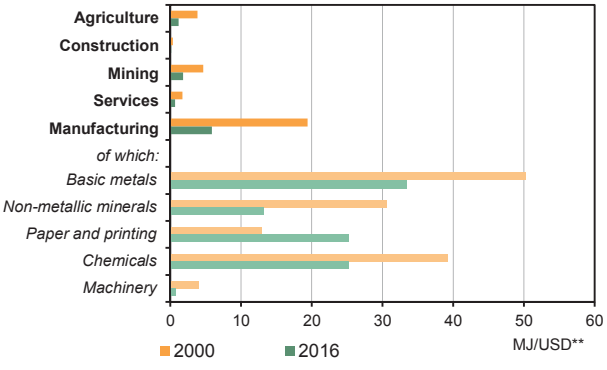
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



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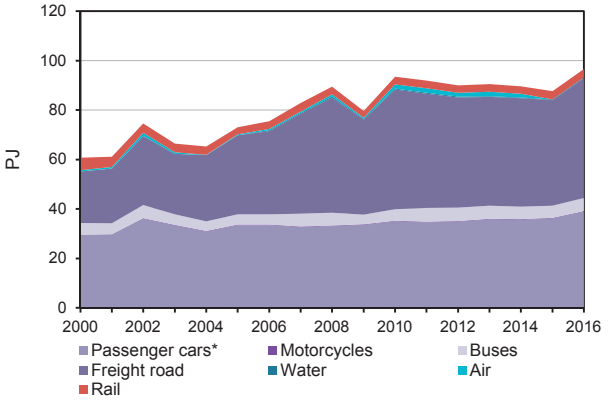
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

SLOVAK REPUBLIC

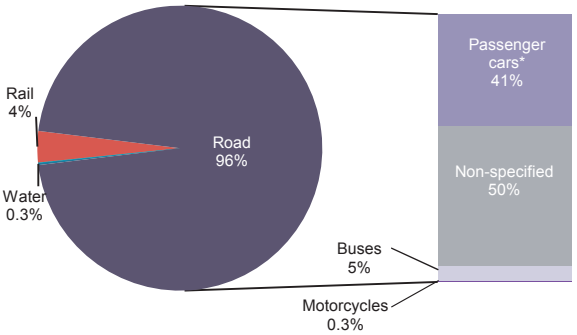
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	36	4	36	27	1.9	NA
2016	45	3	37	46	1.3	NA

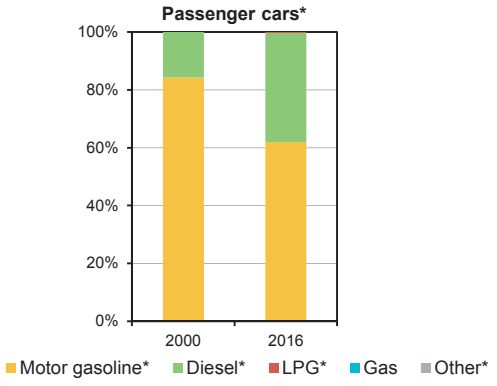
Transport energy consumption by mode/vehicle type



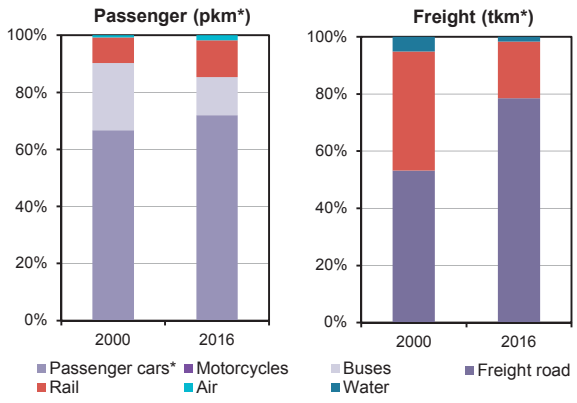
Transport energy consumption by mode/vehicle type, 2016**



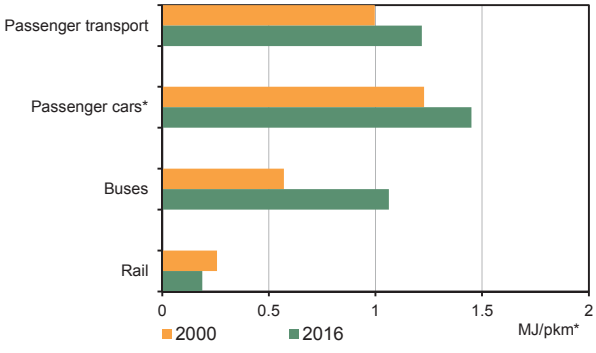
Energy consumption in road transport by source



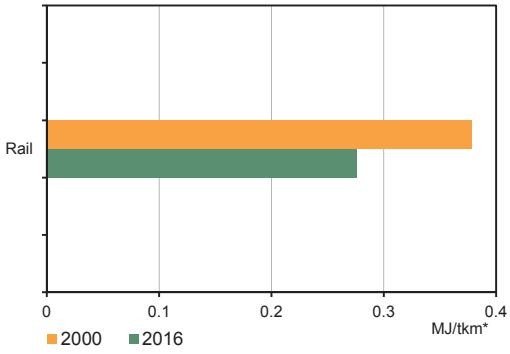
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport



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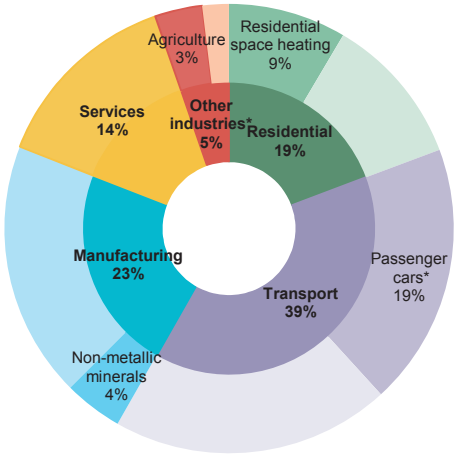
**Energy consumption for domestic airplanes is not available for the year 2016, this may affect to the current distribution of energy consumption

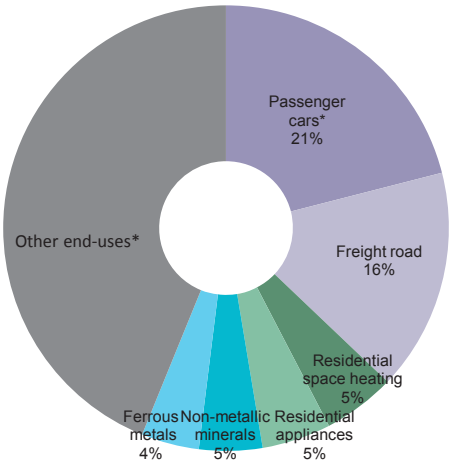
SPAIN

Cross-sectoral overview

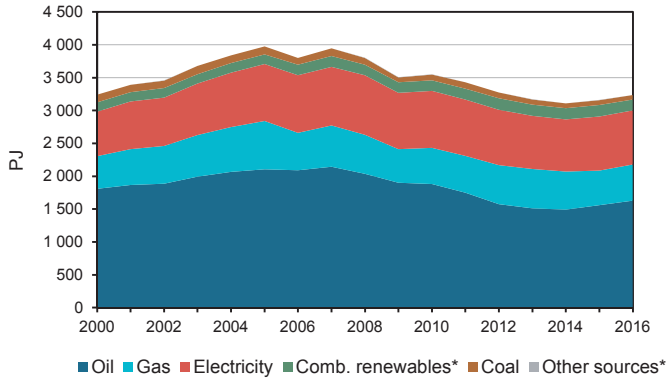
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



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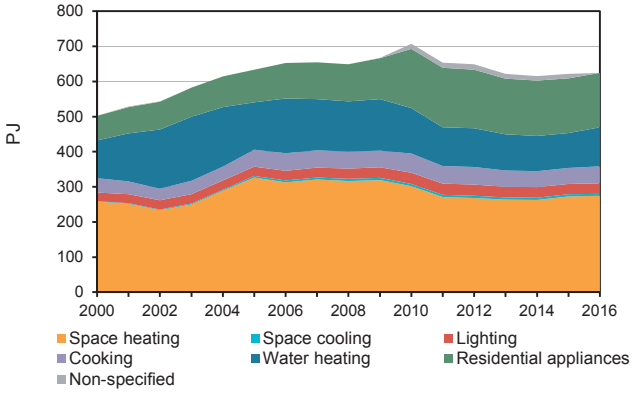
**Includes emissions reallocated from electricity and heat generation.

SPAIN

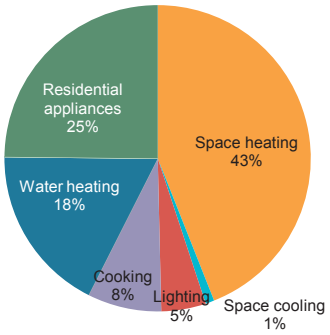
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	503	51	41	12	89	3.1
2016	624	56	46	13	92	2.5

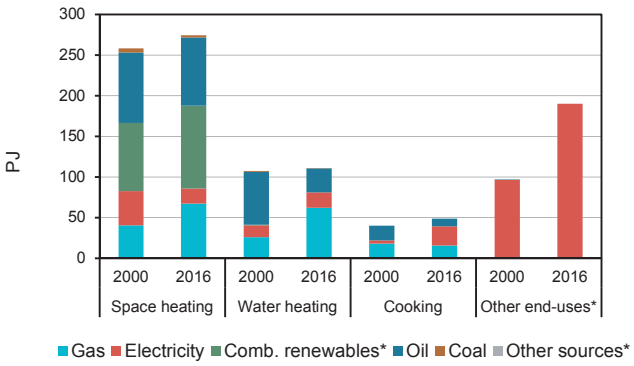
Residential energy consumption by end-use



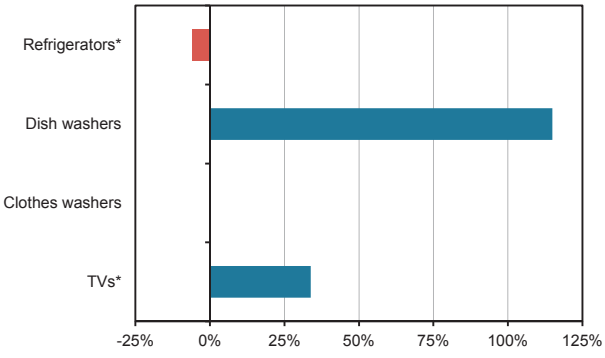
Residential energy consumption by end-use, 2016



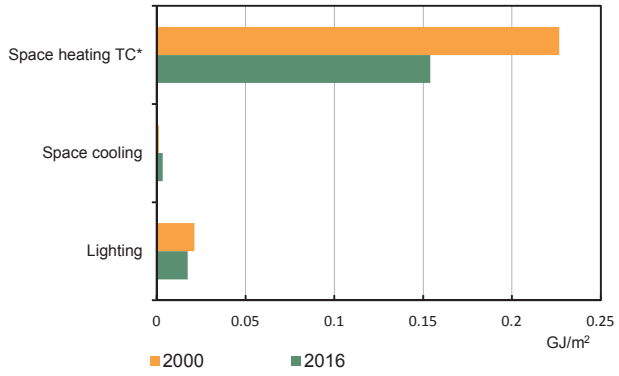
Residential energy consumption by source



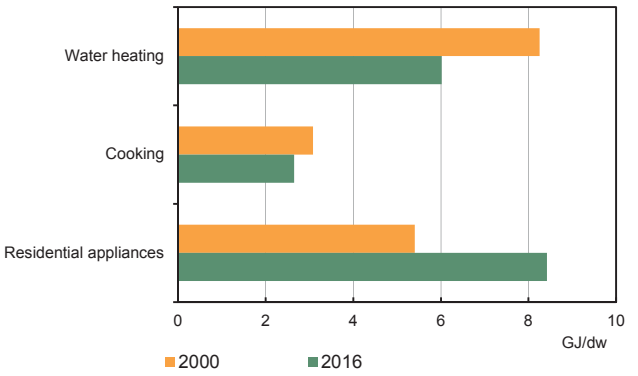
Appliances per dwelling, 2000-10 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



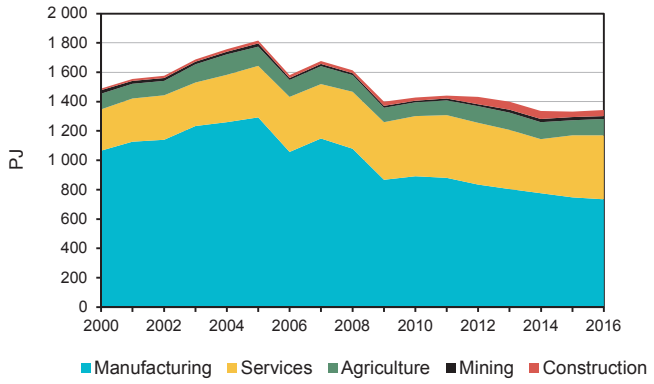
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

SPAIN

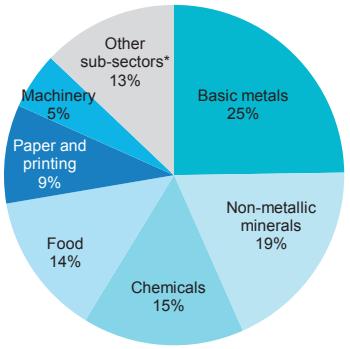
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	1 067	281	141	1 196	177	712
2016	734	445	172	1 524	166	1 054

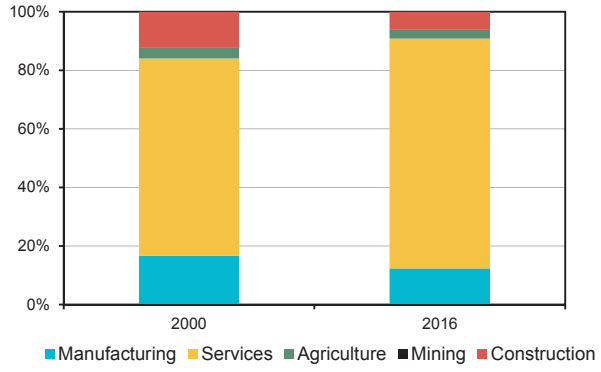
Industry and services energy consumption



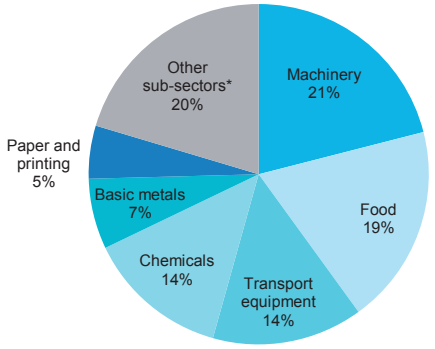
Manufacturing energy consumption by sub-sector, 2016



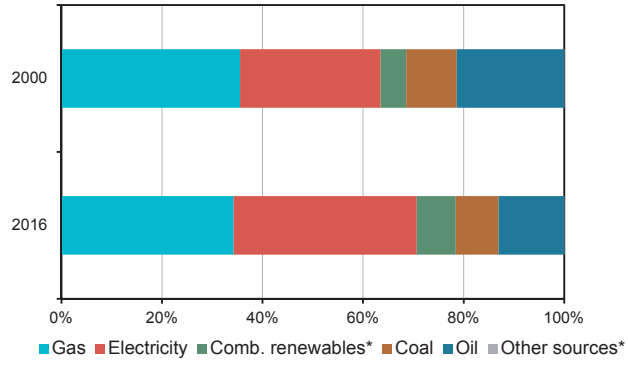
Value added** by sector



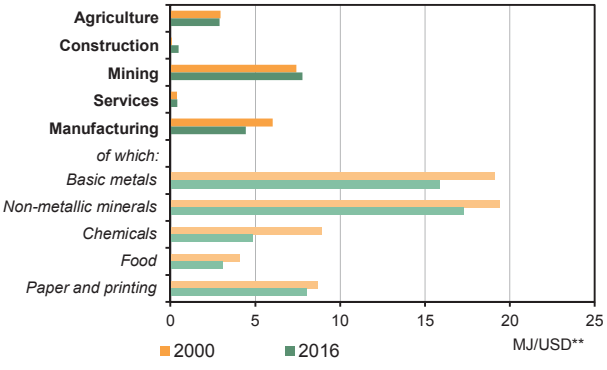
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



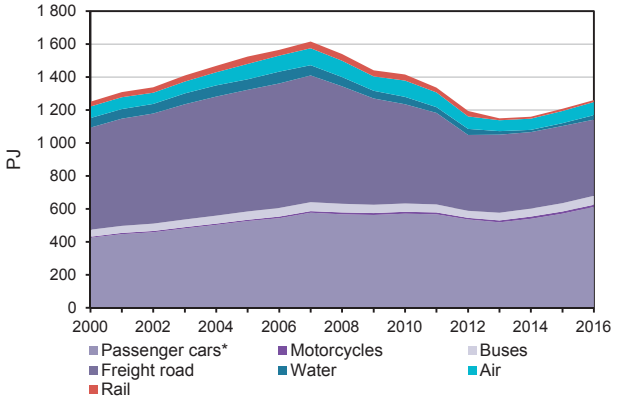
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

SPAIN

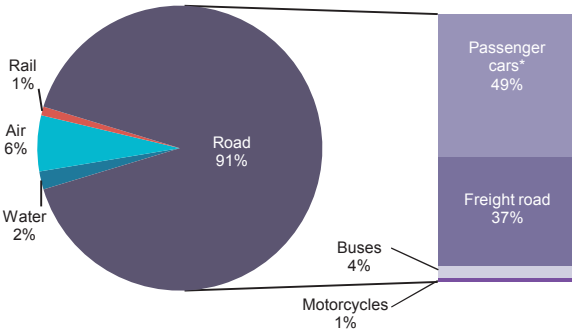
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	560	692	395	346	1.9	2.3
2016	768	493	429	315	1.5	1.4

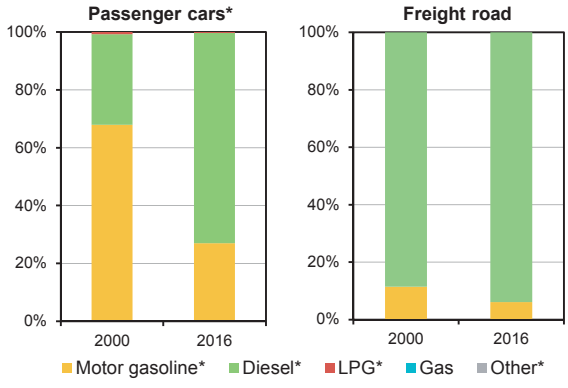
Transport energy consumption by mode/vehicle type



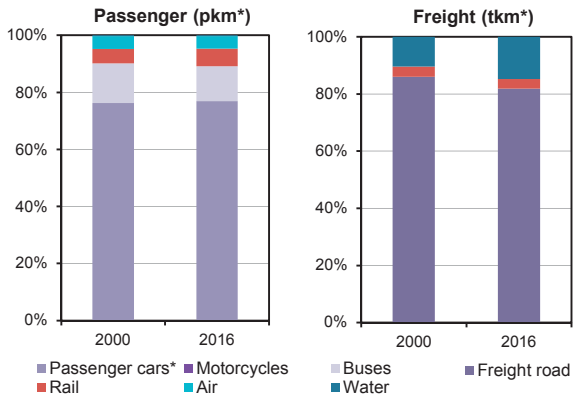
Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source

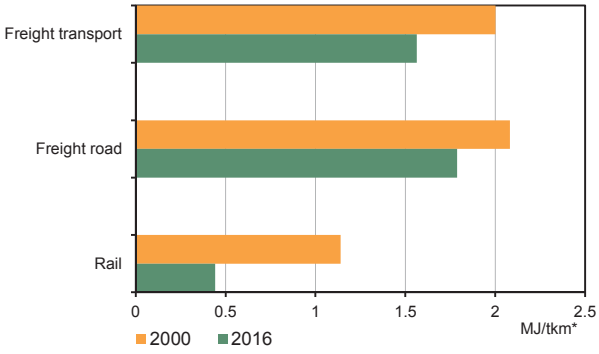


Transport activity by mode/vehicle type



Energy intensities for passenger transport

Energy intensities for freight transport

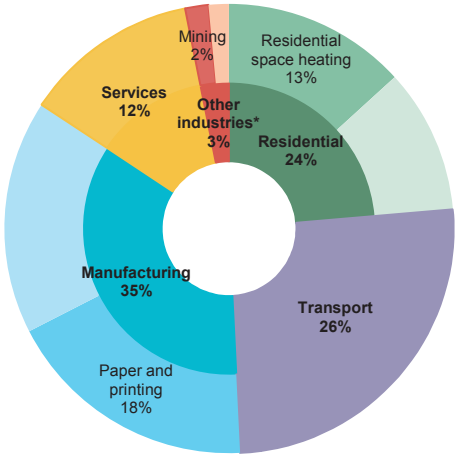


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

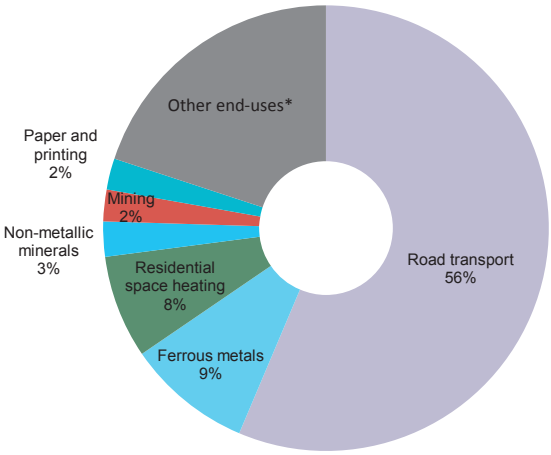
SWEDEN

Cross-sectoral overview

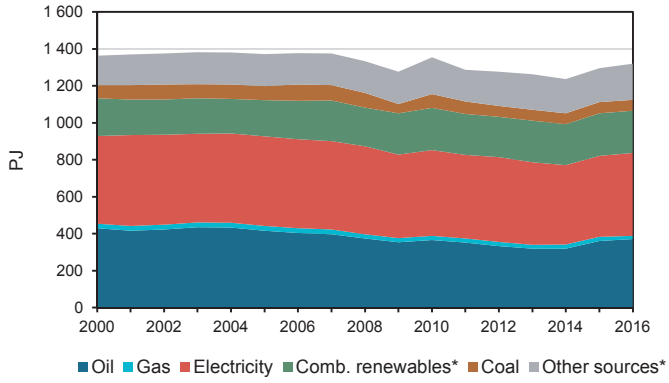
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

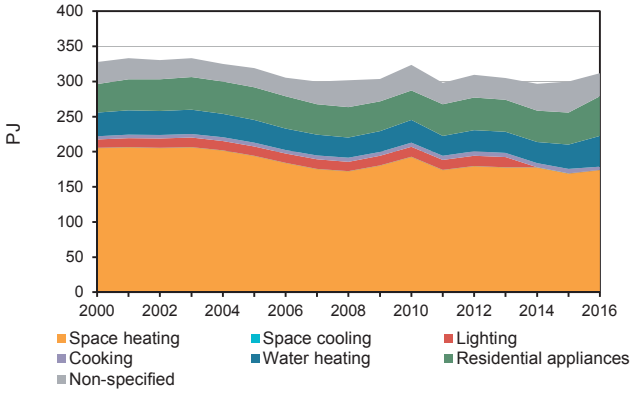
**Includes emissions reallocated from electricity and heat generation.

SWEDEN

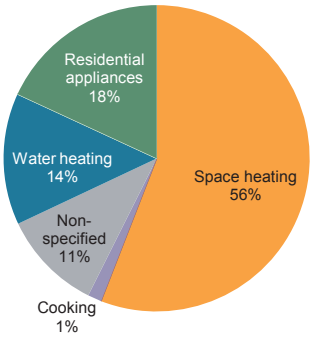
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	328	24	9	37	107	2.1
2016	312	1	10	31	107	2.1

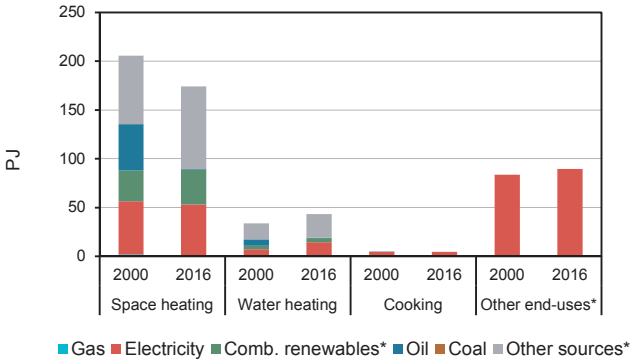
Residential energy consumption by end-use



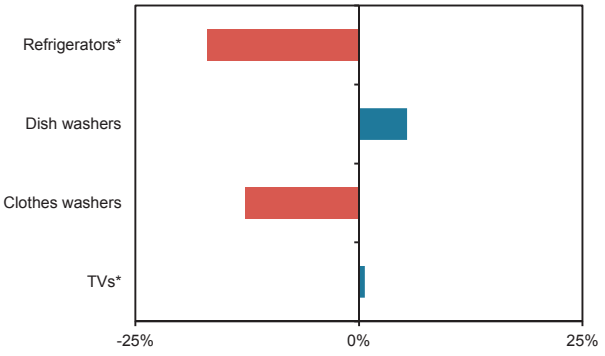
Residential energy consumption by end-use, 2016



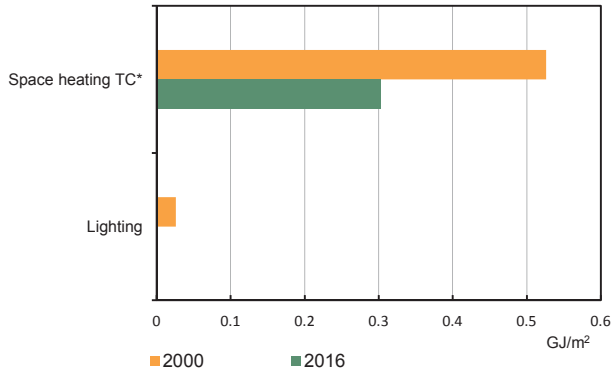
Residential energy consumption by source



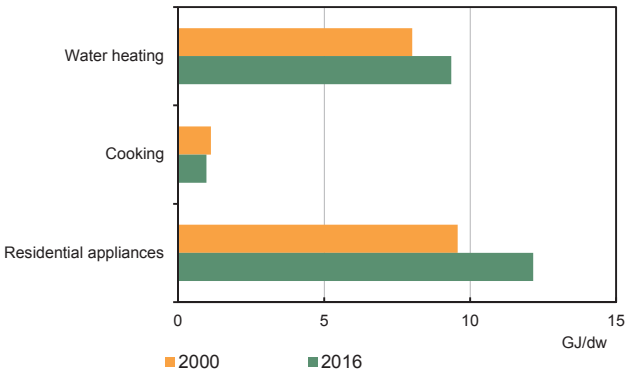
Appliances per dwelling, 2000-13 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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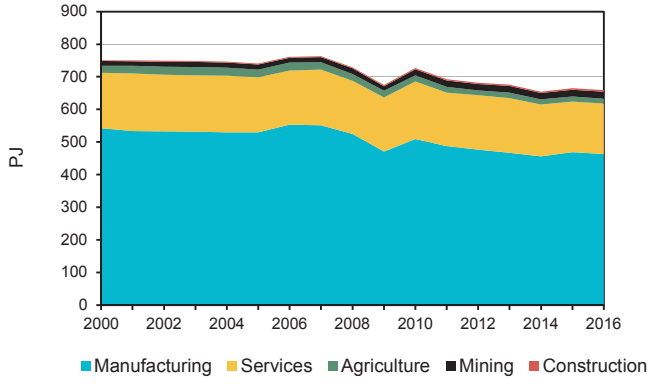
SWEDEN

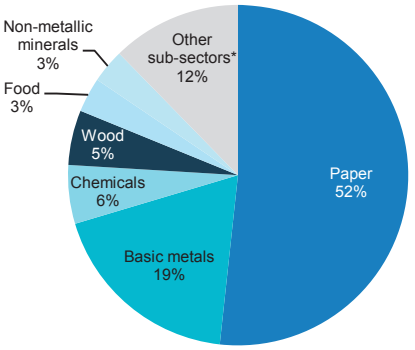
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	543	169	39	317	48	198
2016	463	166	41	449	60	292

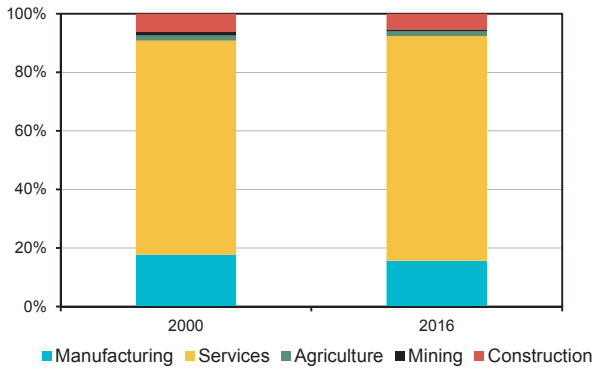
Industry and services energy consumption



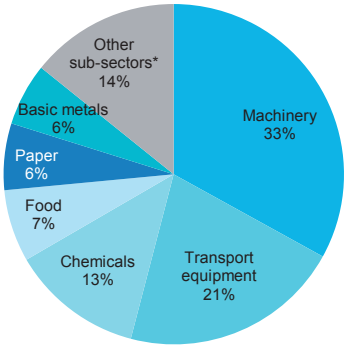
Manufacturing energy consumption by sub-sector, 2016



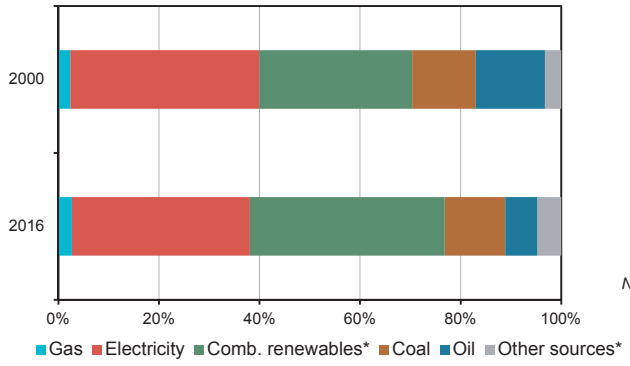
Value added** by sector



Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities

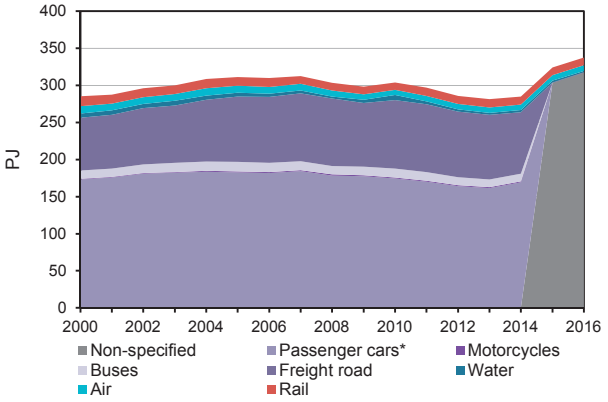
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

SWEDEN

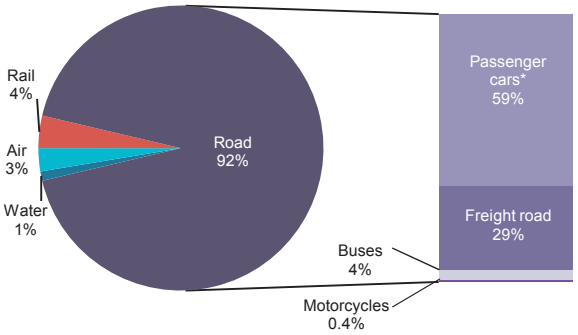
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	199	86	127	66	1.8	4.4
2016	12	8	145	66	1.7	2.9

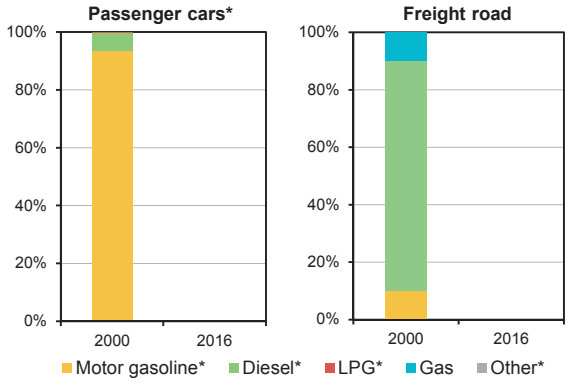
Transport energy consumption by mode/vehicle type



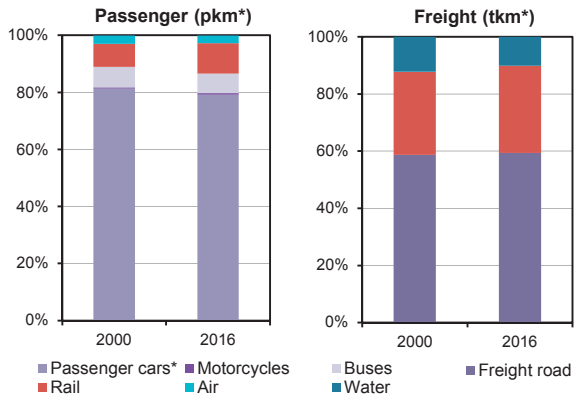
Transport energy consumption by mode/vehicle type, 2014



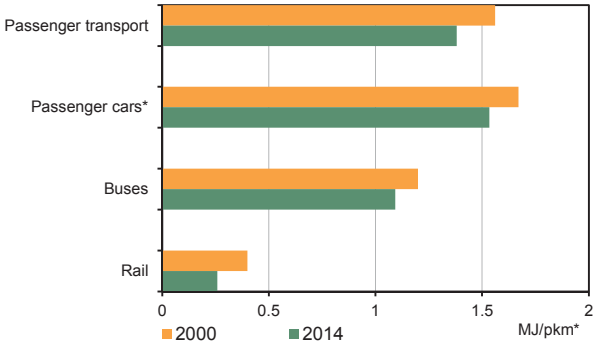
Energy consumption in road transport by source



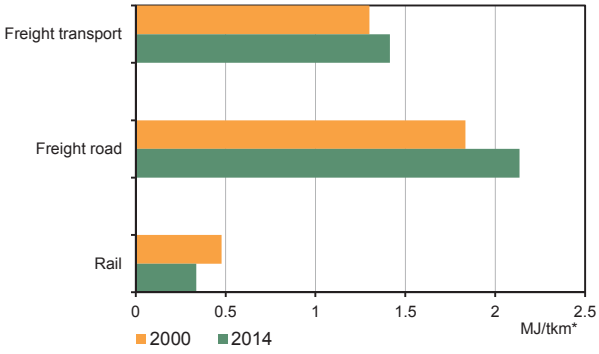
Transport activity by mode/vehicle type



Energy intensities for passenger transport



Energy intensities for freight transport



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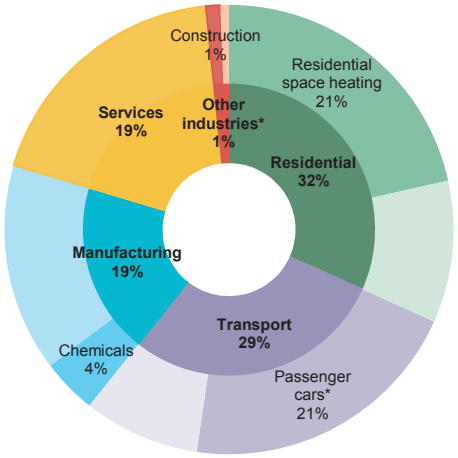
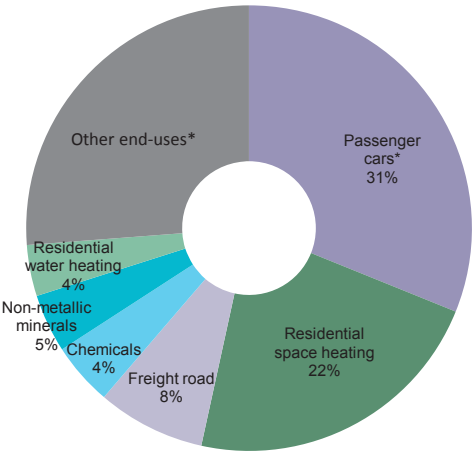
SWITZERLAND

Cross-sectoral overview

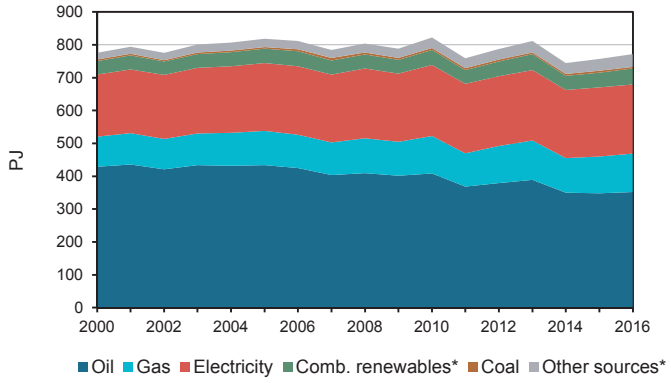
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



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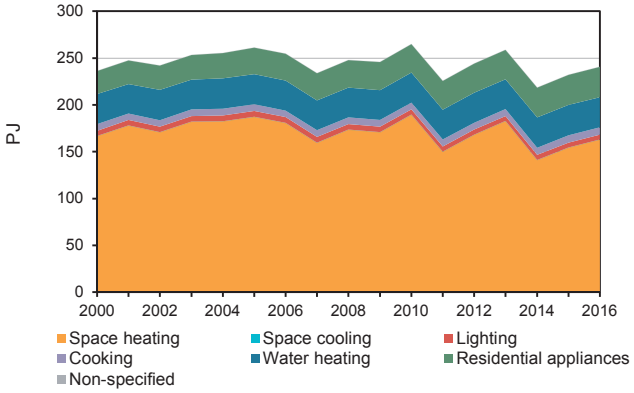
**Includes emissions reallocated from electricity and heat generation.

SWITZERLAND

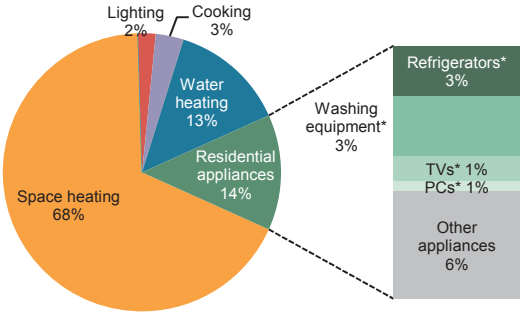
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	236	78	7	33	119	2.3
2016	241	69	8	29	129	2.3

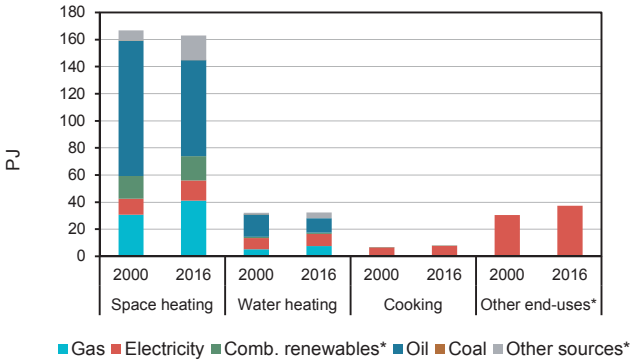
Residential energy consumption by end-use



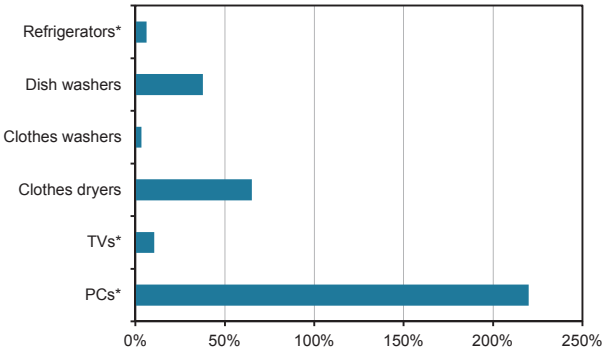
Residential energy consumption by end-use, 2016



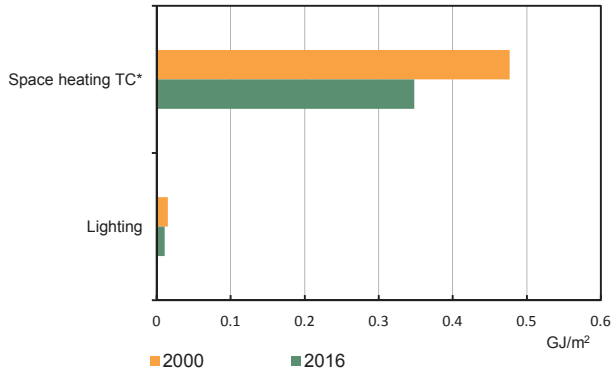
Residential energy consumption by source



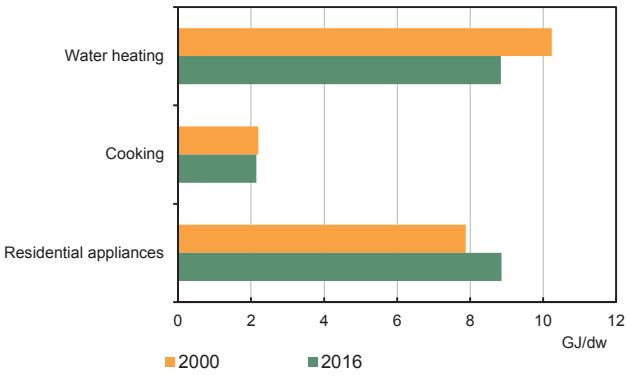
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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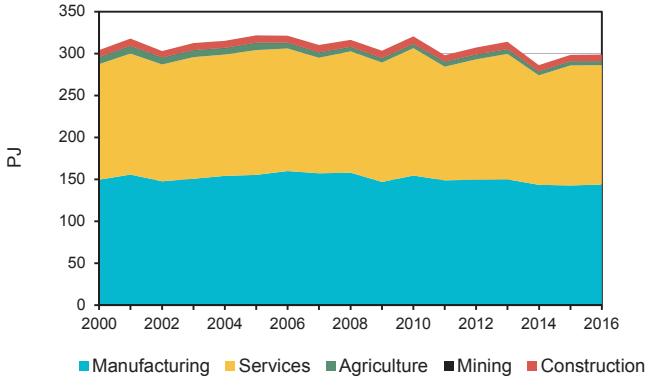
SWITZERLAND

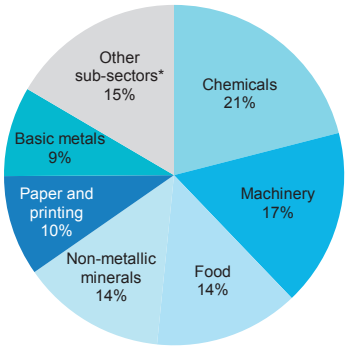
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	150	132	17	347	61	216
2016	144	137	13	458	87	295

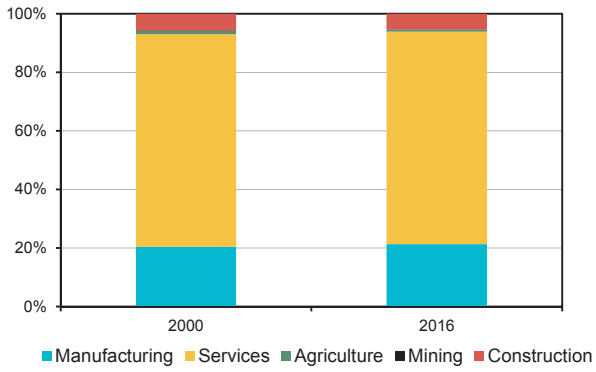
Industry and services energy consumption



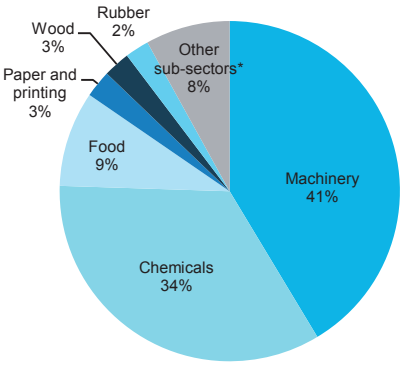
Manufacturing energy consumption by sub-sector, 2016



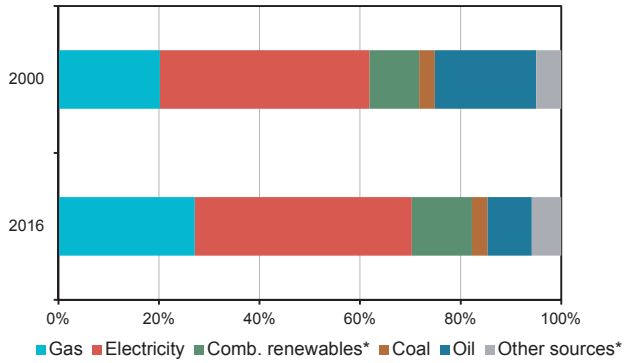
Value added** by sector



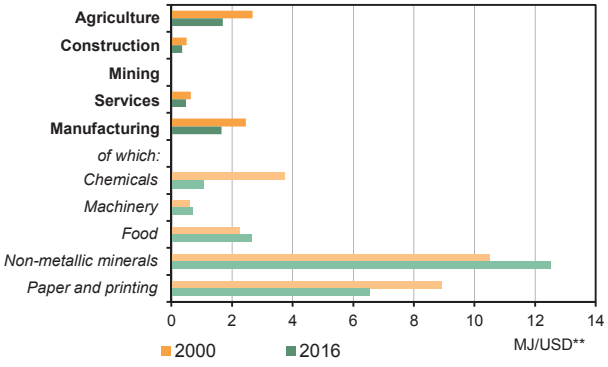
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



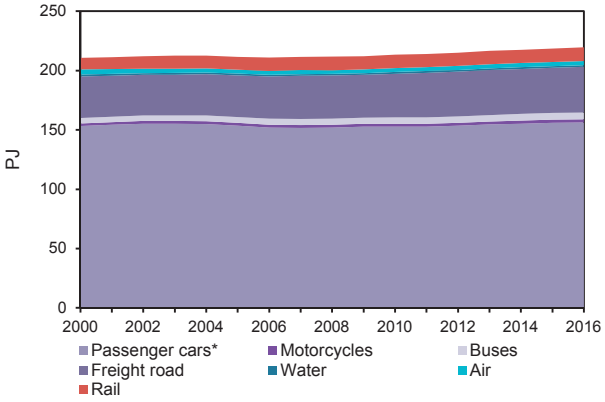
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

SWITZERLAND

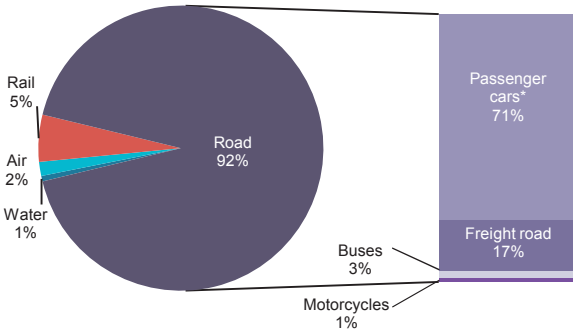
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	173	38	94	25	1.6	2.6
2016	178	41	122	29	1.7	2.6

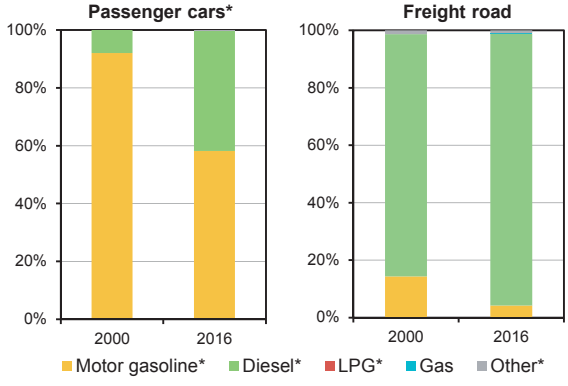
Transport energy consumption by mode/vehicle type



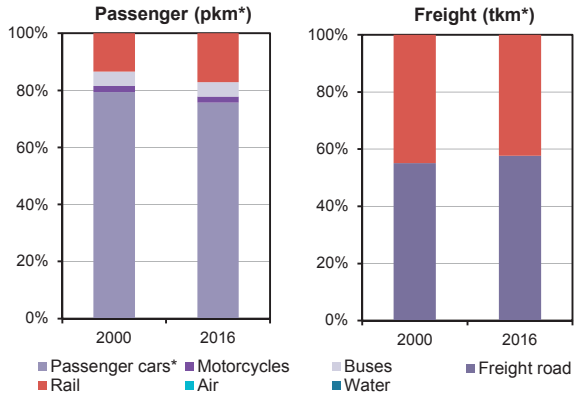
Transport energy consumption by mode/vehicle type, 2016



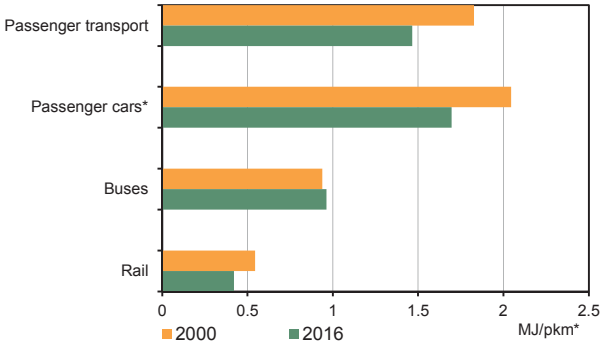
Energy consumption in road transport by source



Transport activity by mode/vehicle type



Energy intensities for passenger transport



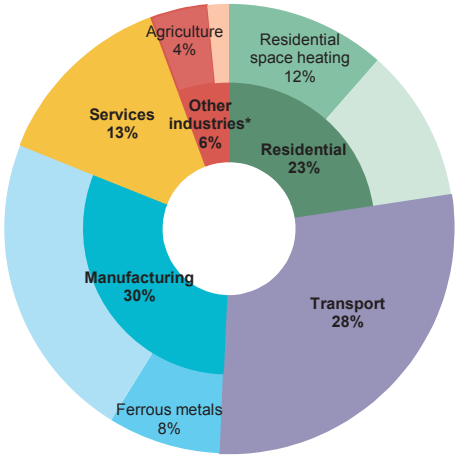
Energy intensities for freight transport

*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

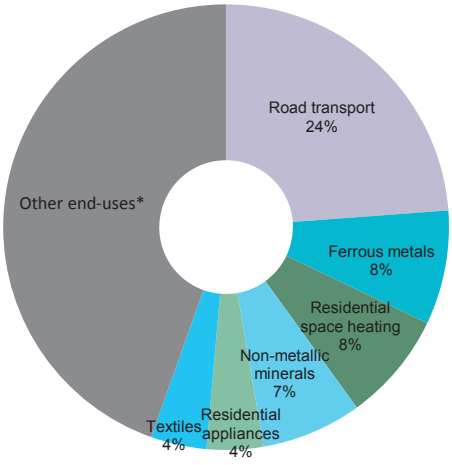
TURKEY

Cross-sectoral overview

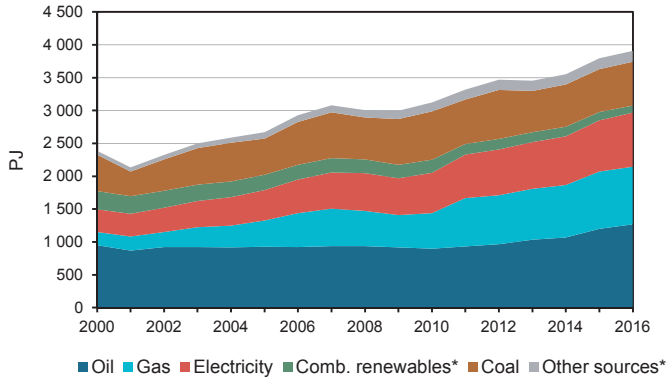
Largest end-uses by sector, 2016



Top six CO_2 emitting end-uses, 2016**



Final energy consumption by source



*Other industries includes agriculture, mining and construction; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

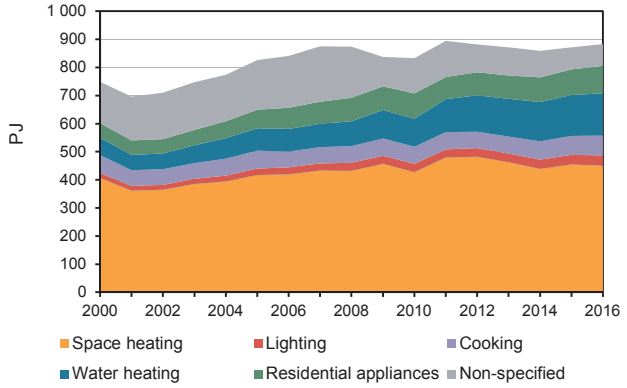
**Includes emissions reallocated from electricity and heat generation.

TURKEY

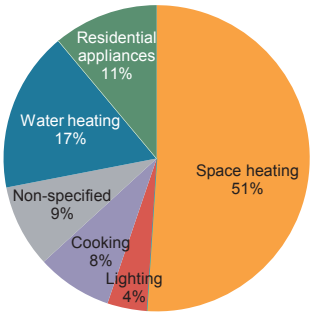
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	749	31	64	12	NA	4.5
2016	883	74	79	11	NA	3.5

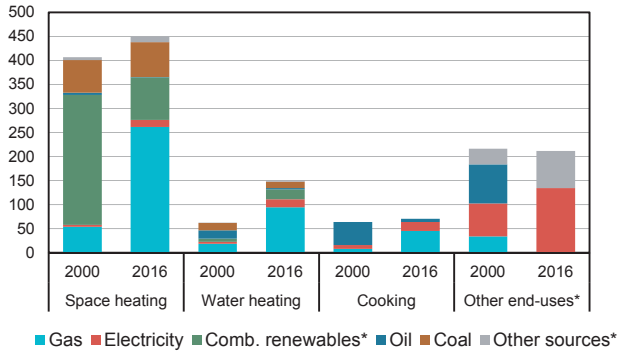
Residential energy consumption by end-use



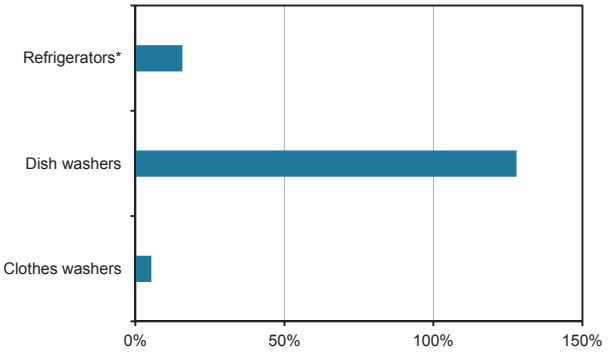
Residential energy consumption by end-use, 2016



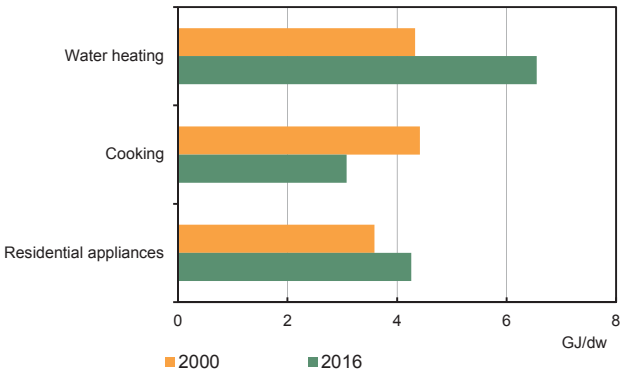
Residential energy consumption by source



Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per dwelling



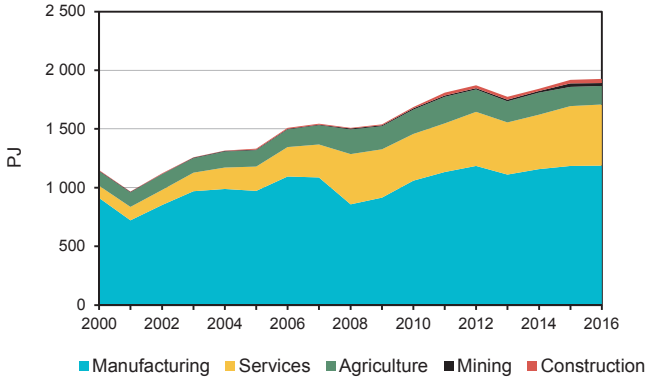
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

TURKEY

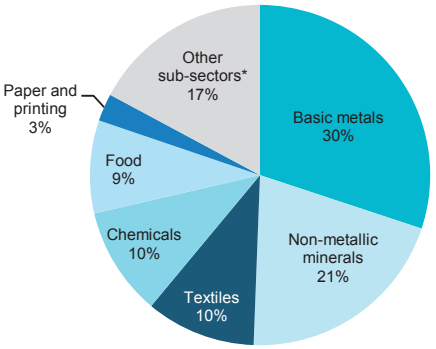
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	912	104	132	852	125	472
2016	1 189	519	219	1 836	298	977

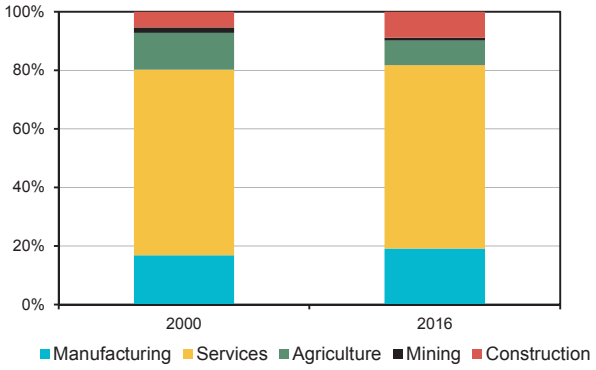
Industry and services energy consumption



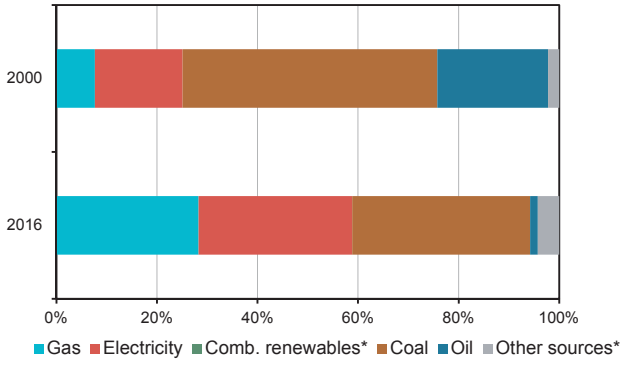
Manufacturing energy consumption by sub-sector, 2016



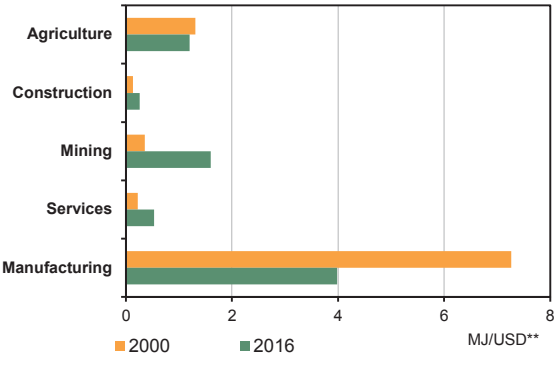
Value added** by sector



Manufacturing energy consumption by source



Selected energy intensities



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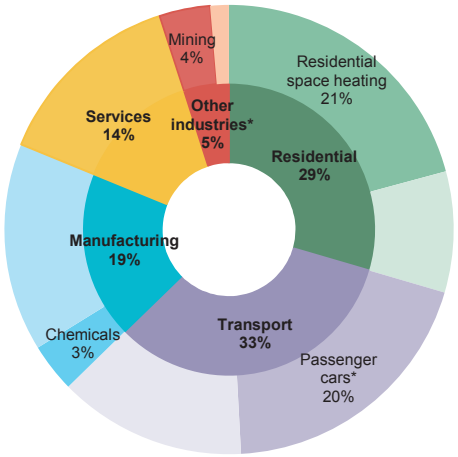
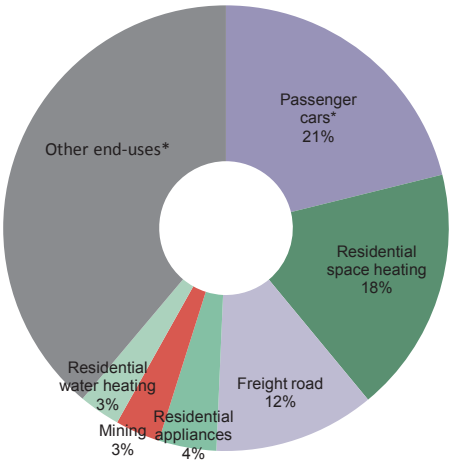
UNITED KINGDOM

Cross-sectoral overview

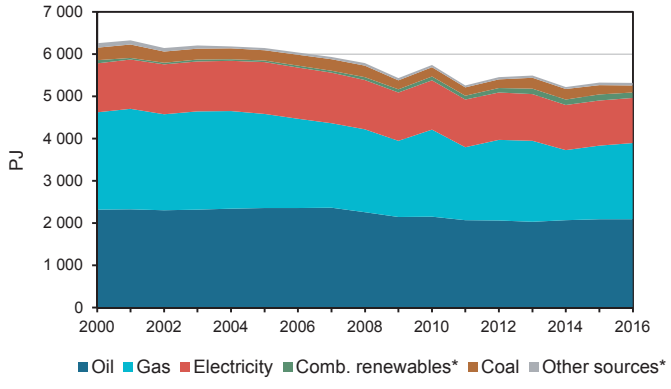
Largest end-uses by sector, 2016



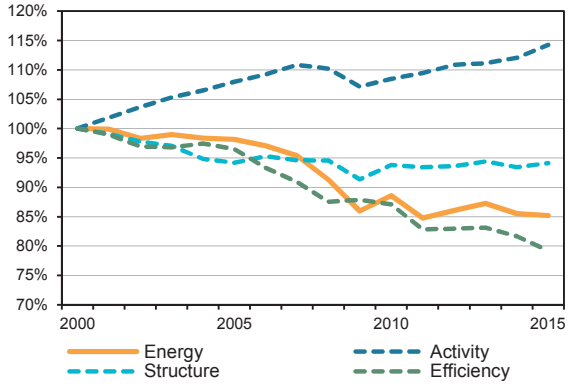
Top six CO_2 emitting end-uses, 2016**



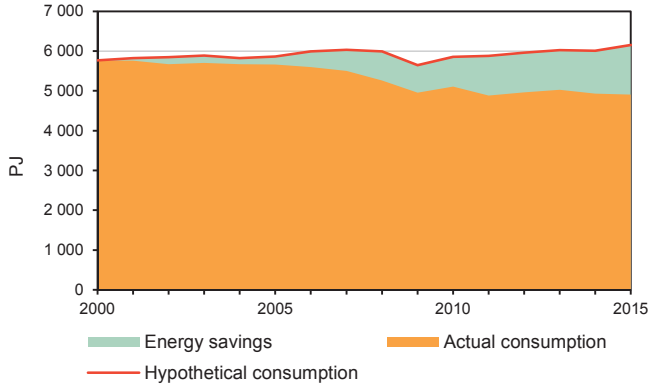
Final energy consumption by source



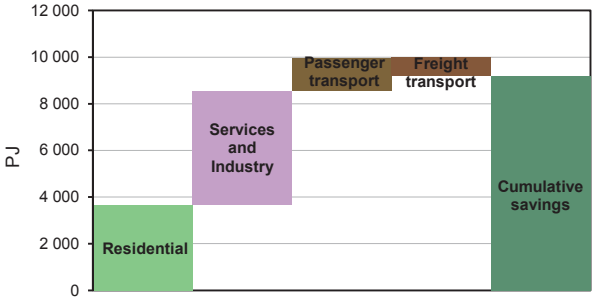
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-15***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

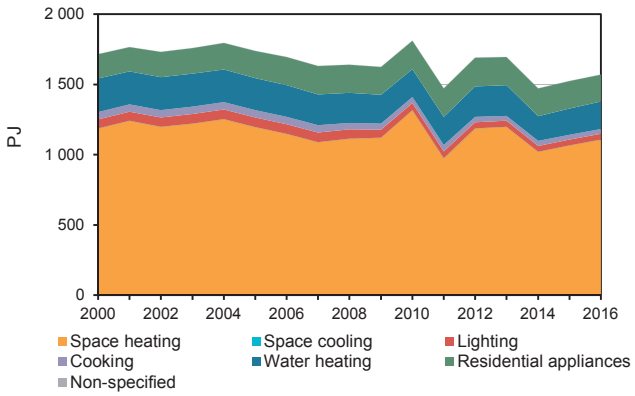
***These figures display results from the IEA decomposition analysis and cover approximately 96% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

UNITED KINGDOM

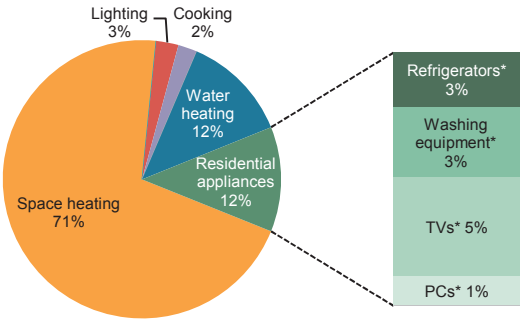
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	1 715	93	59	29	89	2.4
2016	1 570	86	66	24	97	2.3

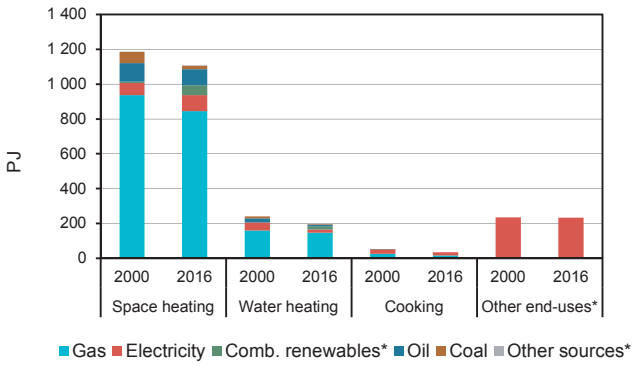
Residential energy consumption by end-use



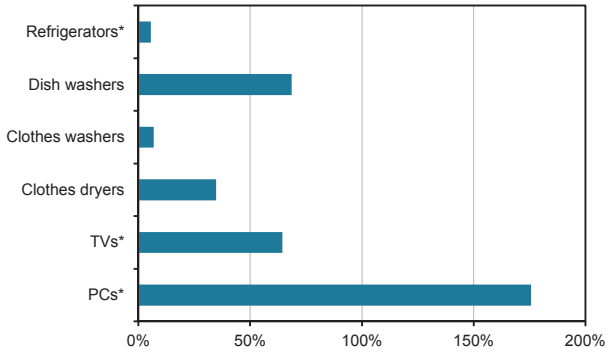
Residential energy consumption by end-use, 2016



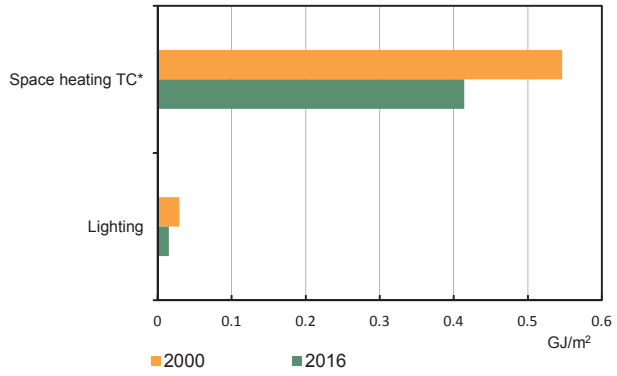
Residential energy consumption by source



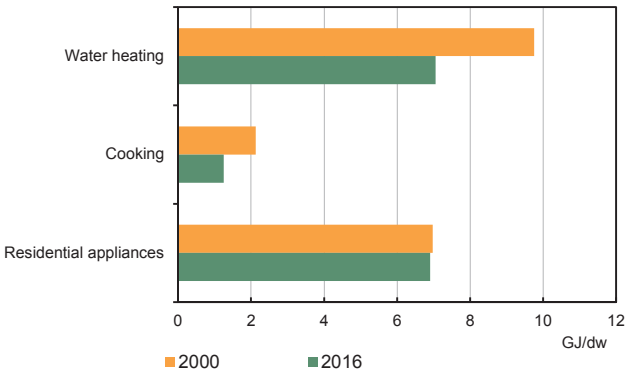
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



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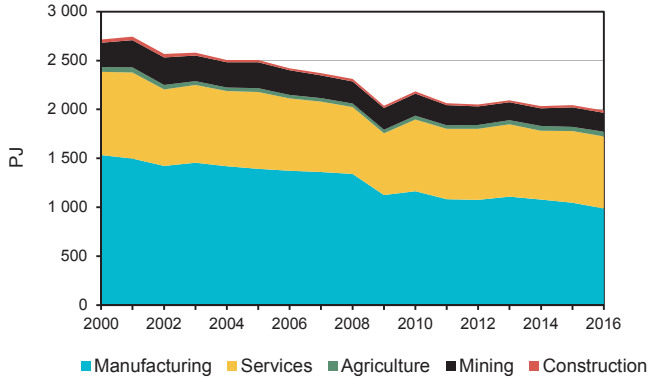
UNITED KINGDOM

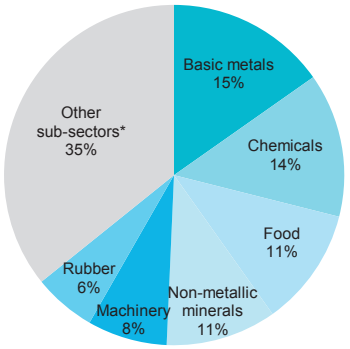
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	1 534	852	330	1 934	238	1 283
2016	986	734	266	2 543	215	1 794

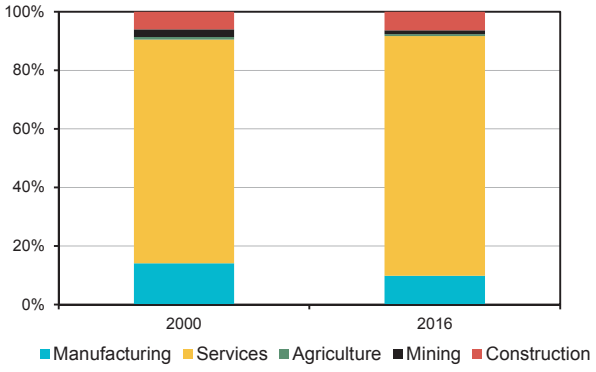
Industry and services energy consumption



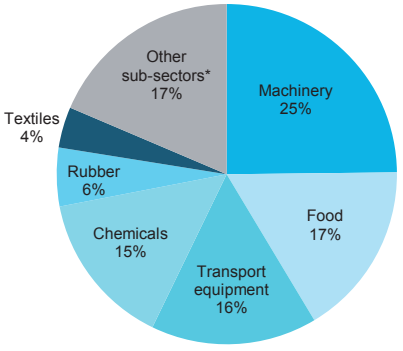
Manufacturing energy consumption by sub-sector, 2016



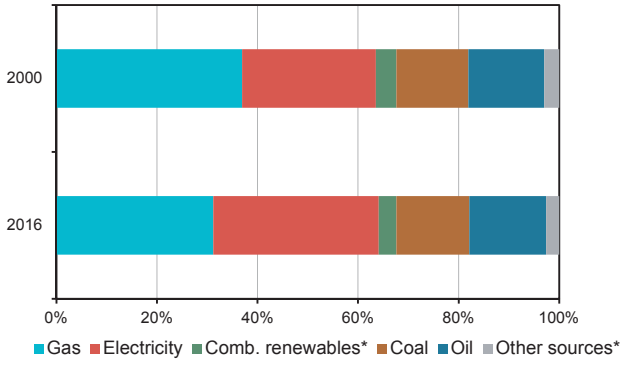
Value added** by sector



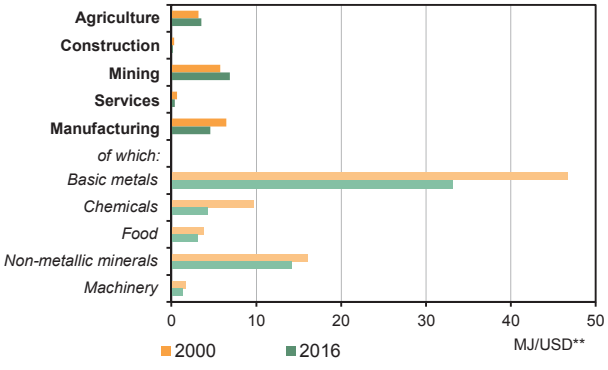
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



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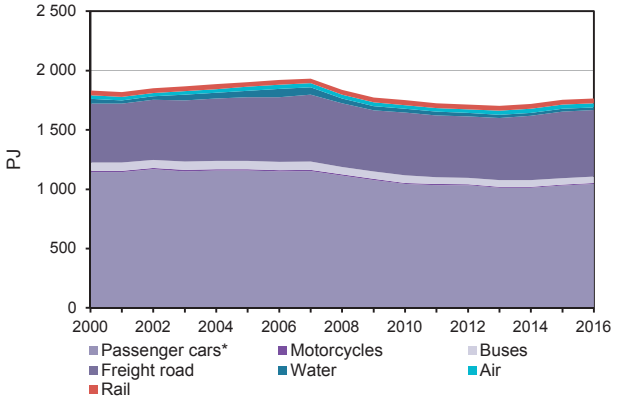
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

UNITED KINGDOM

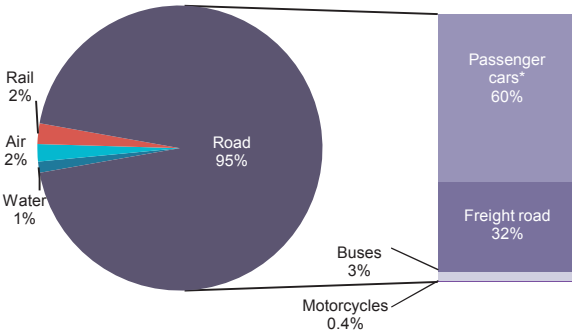
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	1 281	550	759	181	1.7	2.0
2016	1 169	596	811	NA	1.7	NA

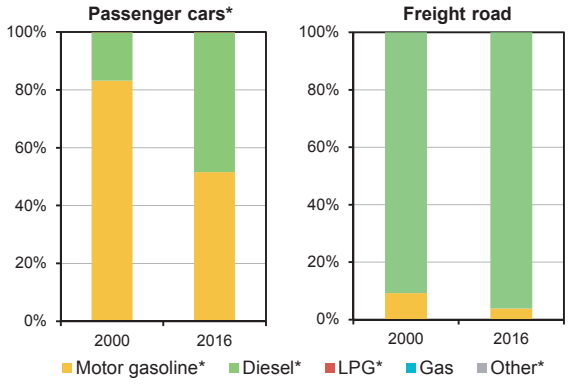
Transport energy consumption by mode/vehicle type



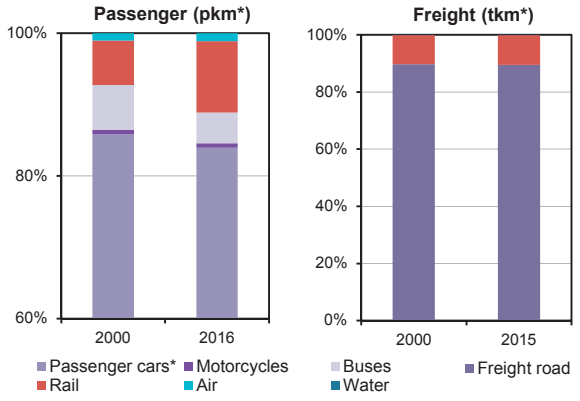
Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source

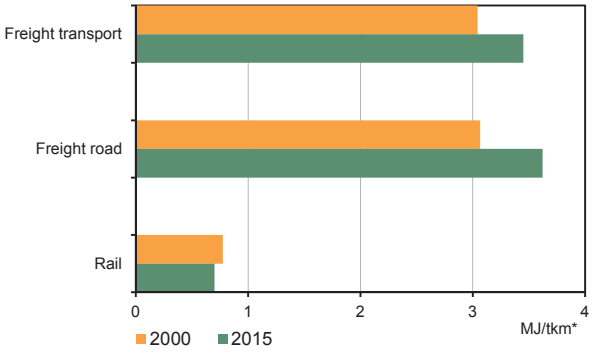


Transport activity by mode/vehicle type



Energy intensities for passenger transport

Energy intensities for freight transport



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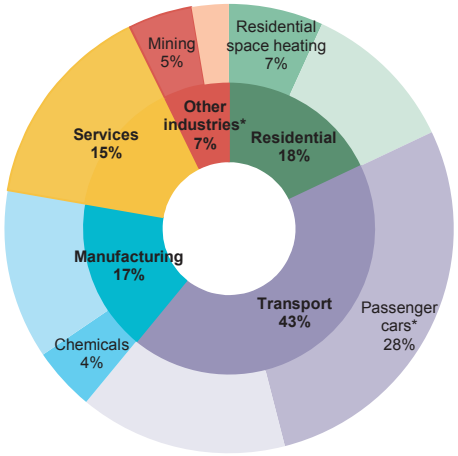
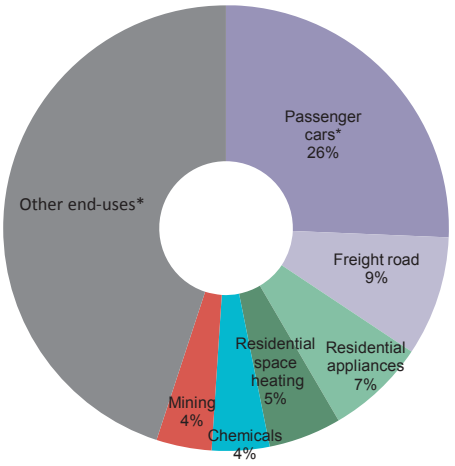
UNITED STATES

Cross-sectoral overview

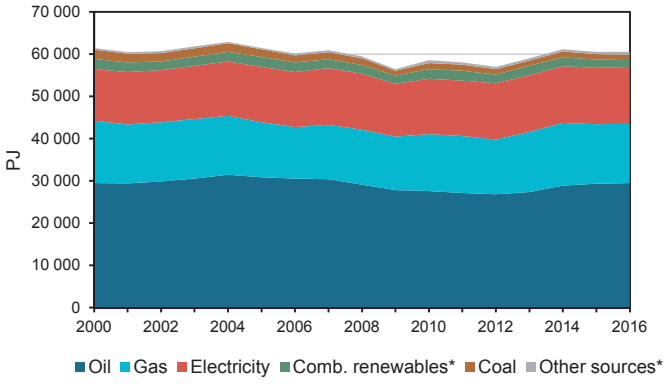
Largest end-uses by sector, 2016



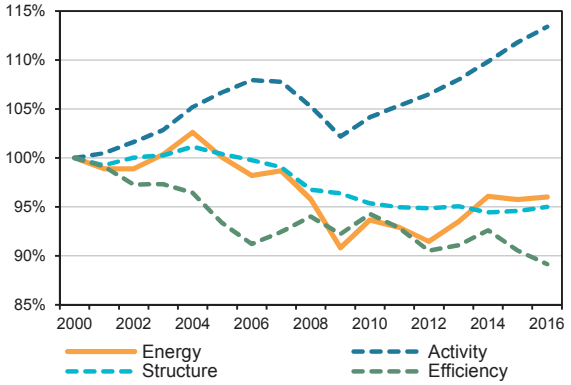
Top six CO_2 emitting end-uses, 2016**



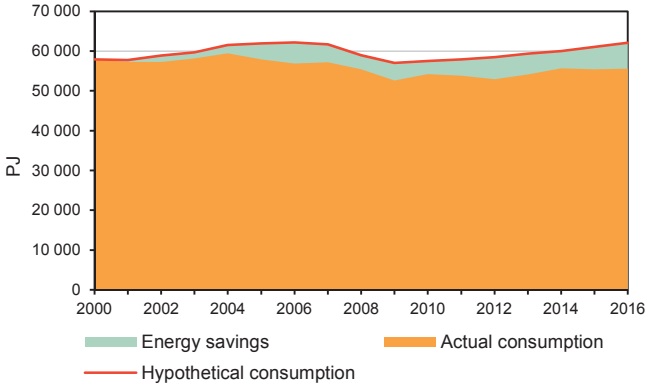
Final energy consumption by source



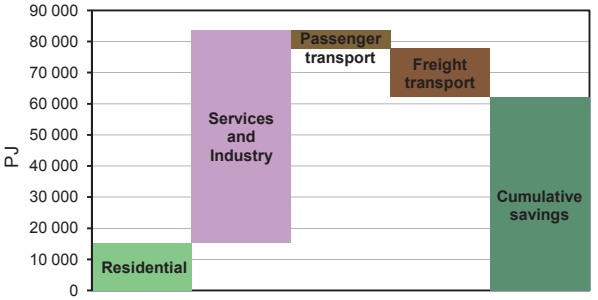
Drivers of final energy consumption***



Estimated energy savings from efficiency***



Estimated cumulative energy savings by sector, 2000-16***



*Other industries includes agriculture, mining and construction; passenger cars includes cars, sport utility vehicles and personal trucks; other end-uses includes the remaining part of emissions beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

**Includes emissions reallocated from electricity and heat generation.

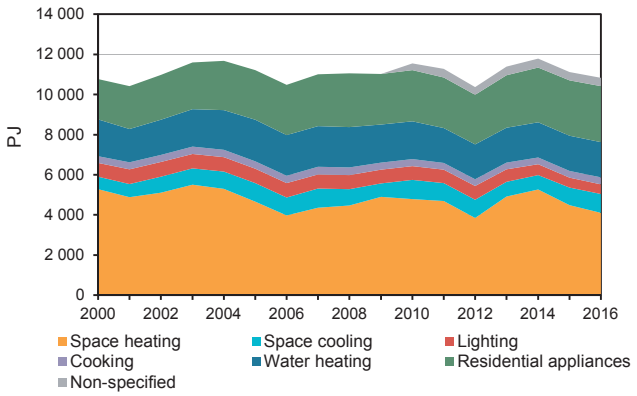
***These figures display results from the IEA decomposition analysis and cover approximately 93% of final energy consumption. For more information on the decomposition methodology, please refer to the methodological notes.

UNITED STATES

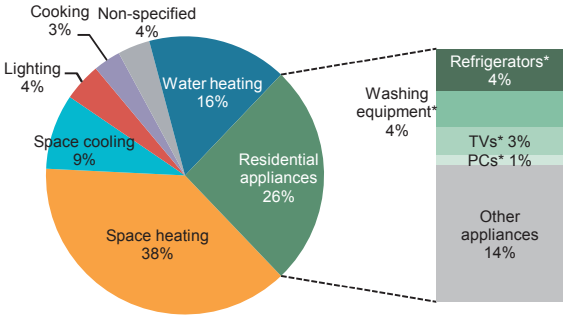
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2000	10 775	84	282	38	196	2.8
2016	10 827	82	324	33	181	2.7

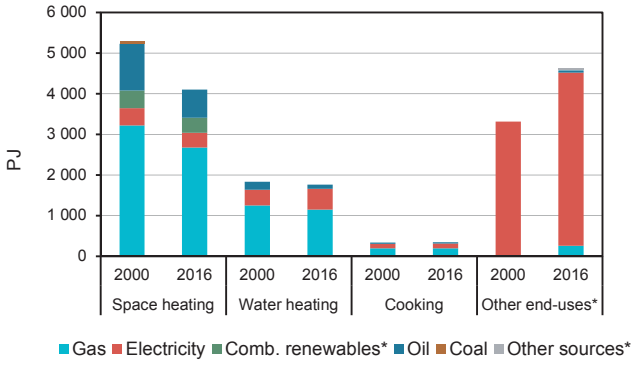
Residential energy consumption by end-use



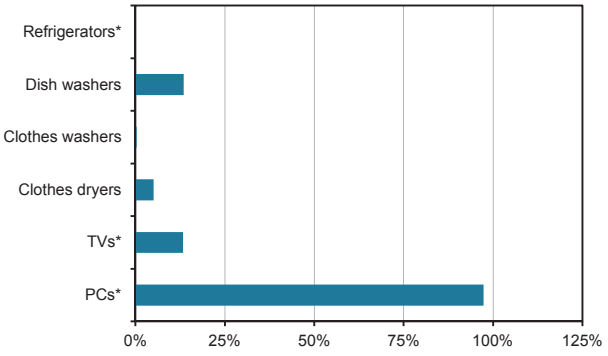
Residential energy consumption by end-use, 2016



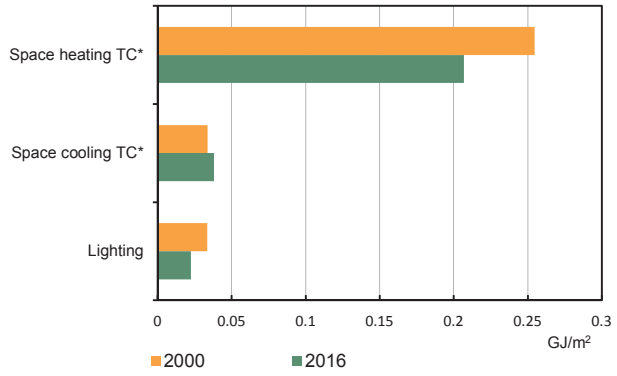
Residential energy consumption by source



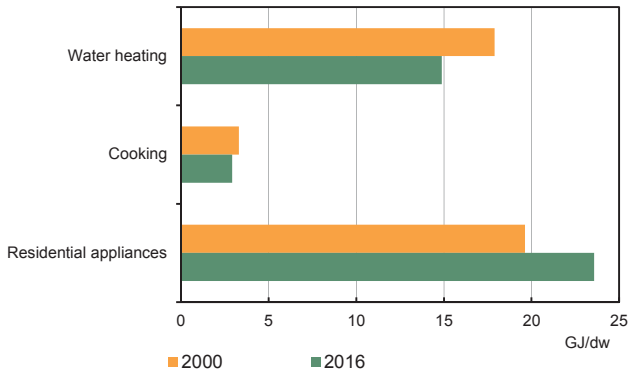
Appliances per dwelling, 2000-16 % change



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling



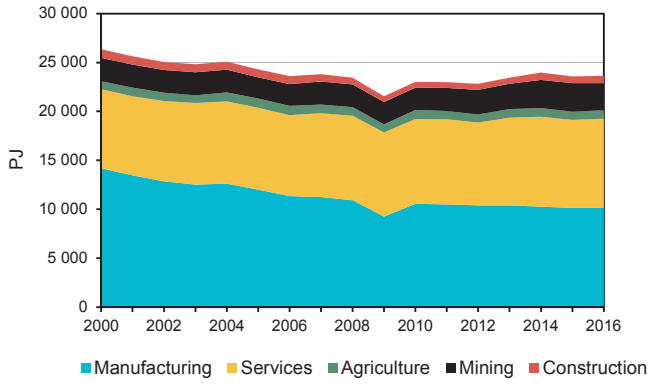
*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; washing equipments includes dish washers, clothes washers and dryers; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

UNITED STATES

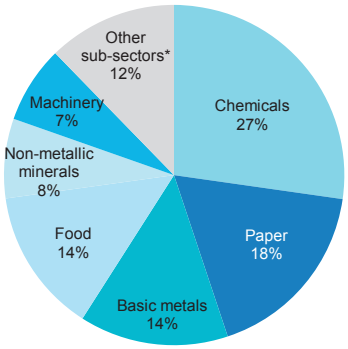
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2000	14 202	8 083	4 068	12 713	1 490	9 444
2016	10 136	9 054	4 385	16 920	1 761	12 821

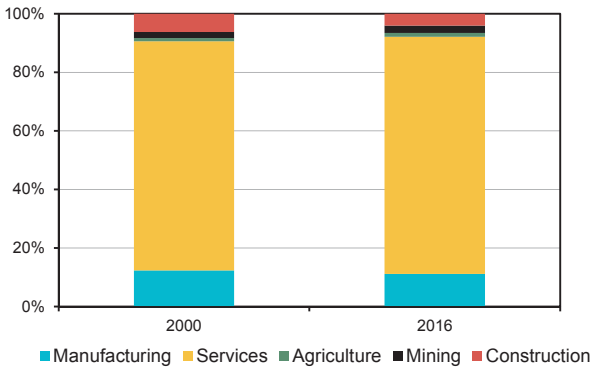
Industry and services energy consumption



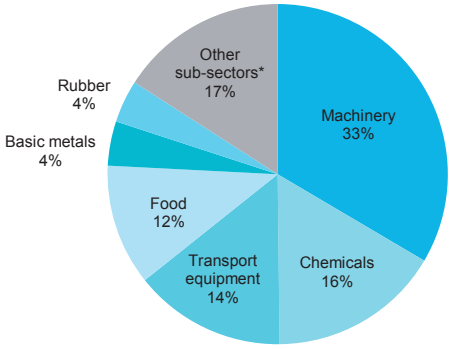
Manufacturing energy consumption by sub-sector, 2016



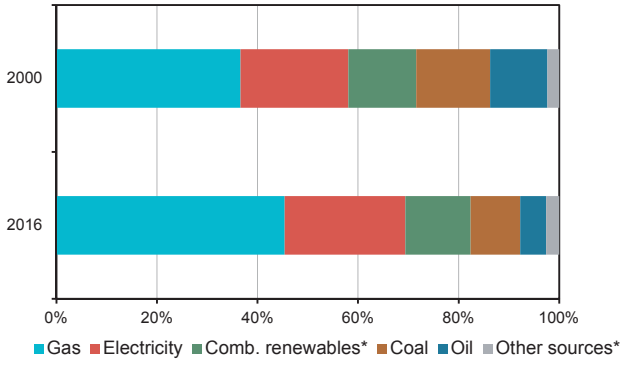
Value added** by sector



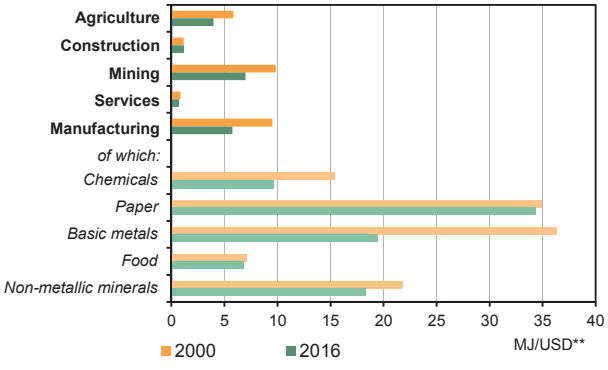
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



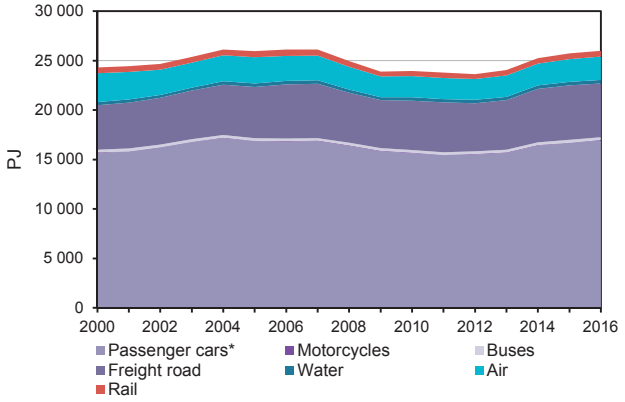
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

UNITED STATES

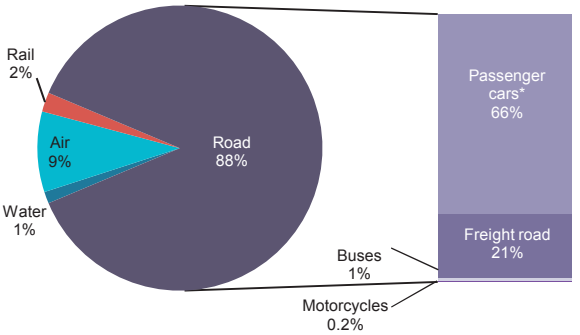
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2000	19 026	5 281	7 950	6 618	1.6	7.4
2016	19 801	6 185	8 051	6 213	1.4	6.5

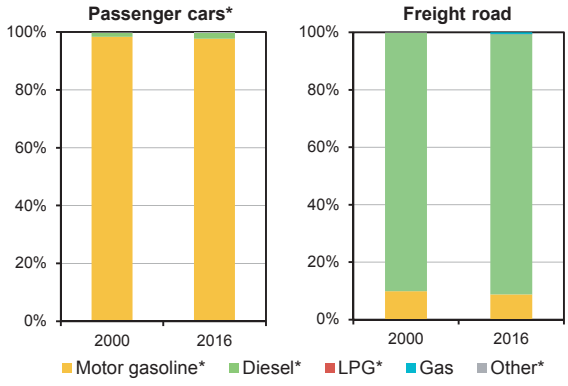
Transport energy consumption by mode/vehicle type



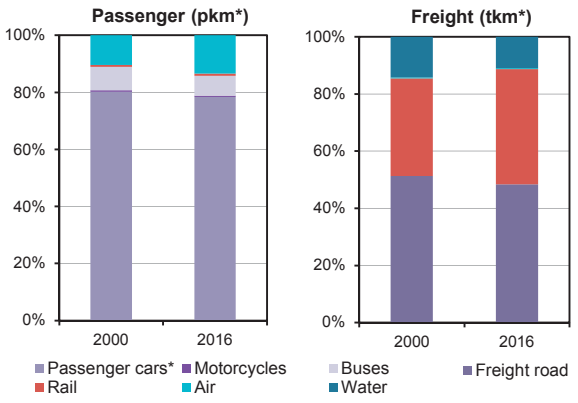
Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source

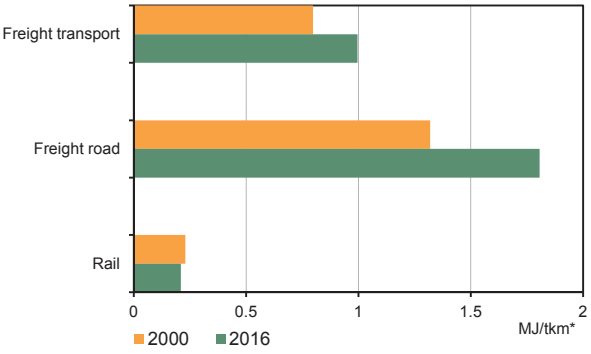


Transport activity by mode/vehicle type



Energy intensities for passenger transport

Energy intensities for freight transport



*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; pkm refers to passenger-kilometres and tkm to tonne-kilometres; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels; LPG refers to liquefied petroleum gas; other includes electricity and other energy sources.

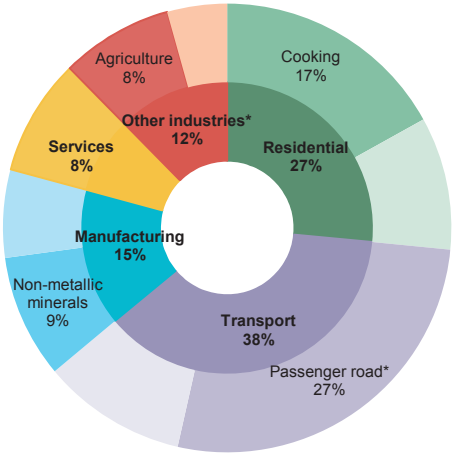
PART II

BEYOND IEA MEMBER COUNTRIES

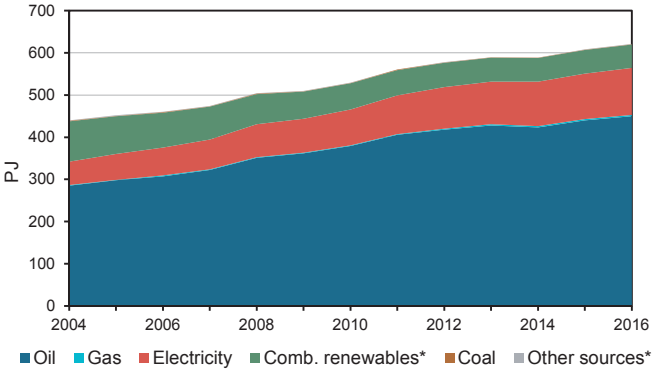
MOROCCO

Cross-sectoral overview

Largest end-uses by sector, 2016



Final energy consumption by source



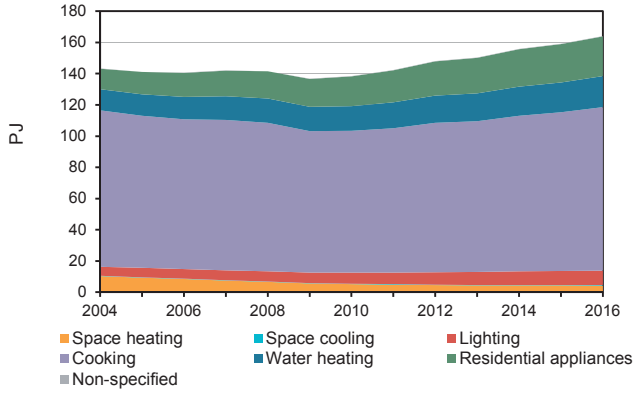
*Other industries includes agriculture, mining and construction; passenger road includes cars, sport utility vehicles, personal trucks motorcycles and buses; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

MOROCCO

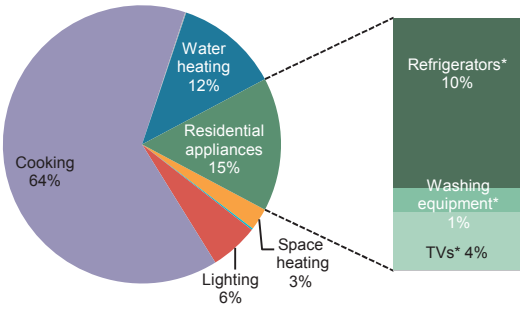
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2004	143	2	30	5	NA	5.2
2016	164	9	34	5	NA	4.5

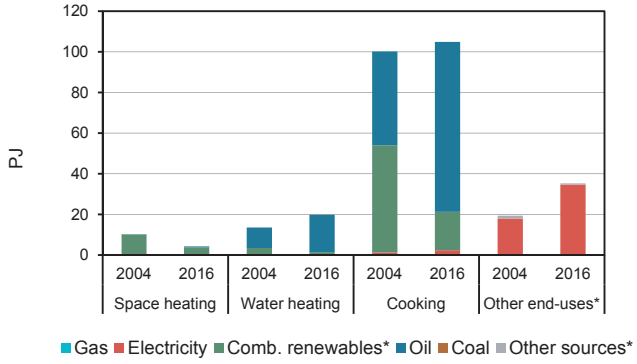
Residential energy consumption by end-use



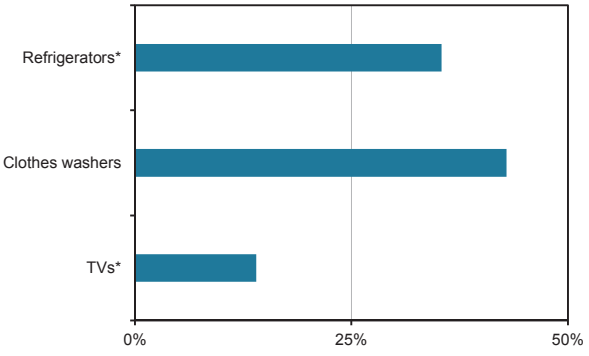
Residential energy consumption by end-use, 2016



Residential energy consumption by source



Equiped dwellings with appliances, 2004-15 % change**



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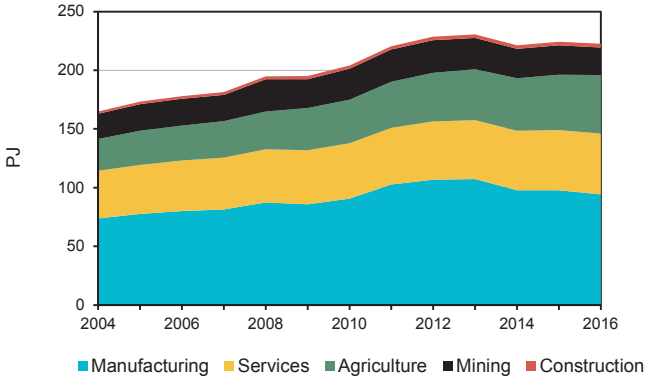
**Calculations based on all dwellings instead of only occupied dwellings.

MOROCCO

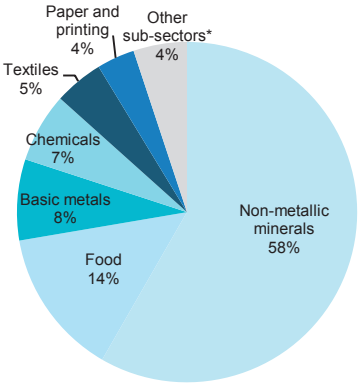
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2007	81	39	56	181	29	95
2016	94	47	77	255	37	131

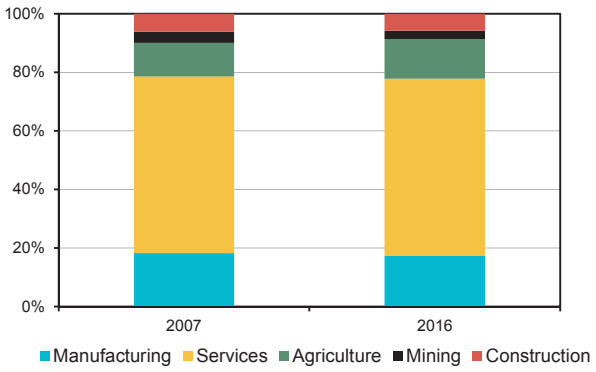
Industry and services energy consumption



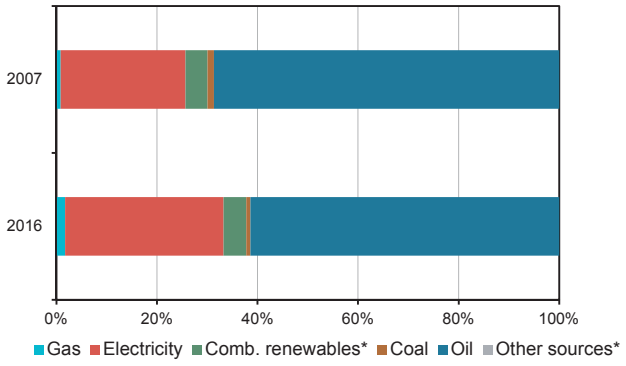
Manufacturing energy consumption by sub-sector, 2016



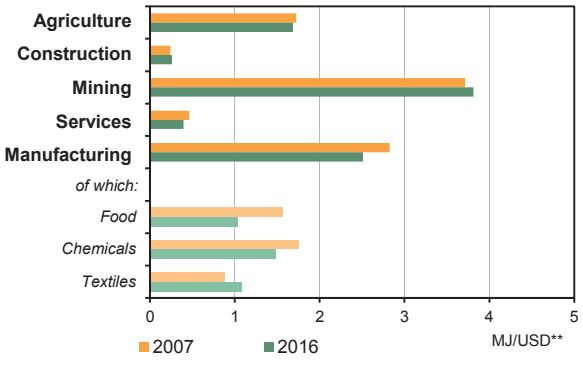
Value added** by sector



Manufacturing energy consumption by source



Selected energy intensities



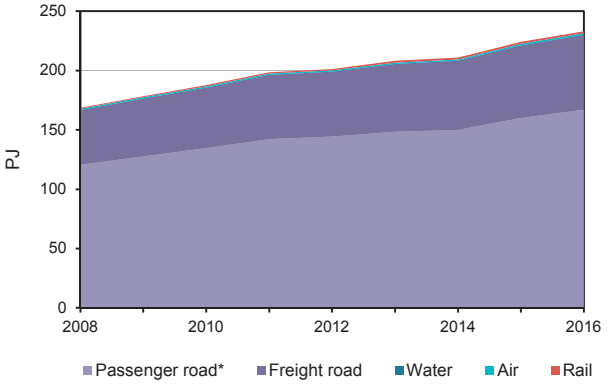
*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

MOROCCO

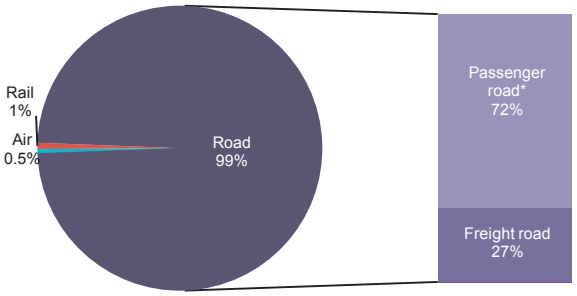
Transport* sector

	Passenger transport consumption (PJ)	Freight transport consumption (PJ)	Pass. transport (billion pkm*)	Freight transport (billion tkm*)	Pass. cars* occupancy (pers/car)	Load of trucks* (tonnes/truck)
2004	122	46	NA	NA	NA	NA
2016	168	63	NA	NA	NA	NA

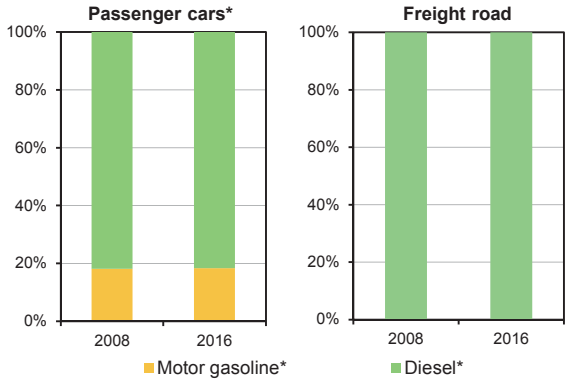
Transport energy consumption by mode/vehicle type



Transport energy consumption by mode/vehicle type, 2016



Energy consumption in road transport by source

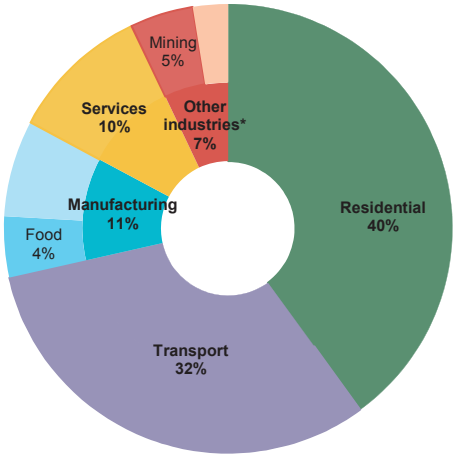


*Transport excludes international marine and aviation bunkers, pipelines, and when possible fuel tourism; passenger cars includes cars, sport utility vehicles and personal trucks; average load of trucks refers to the average load of freight road vehicles; motor gasoline and diesel include liquid biofuels.

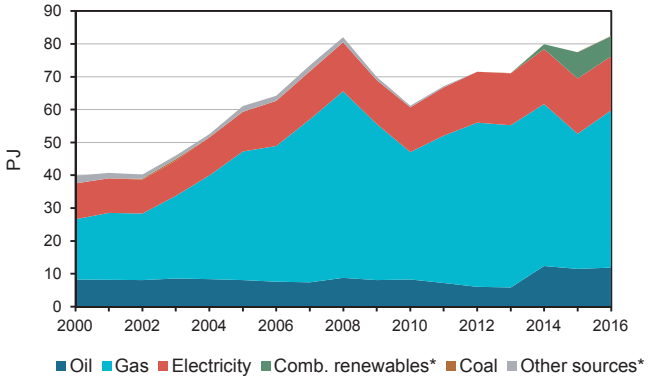
ARMENIA

Cross-sectoral overview

Largest end-uses by sector, 2016



Final energy consumption by source



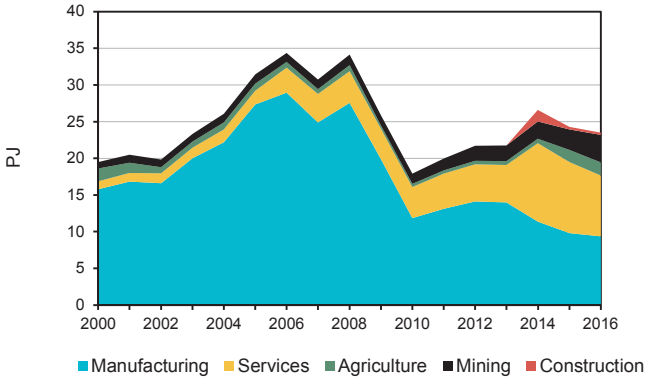
*Other industries includes agriculture, mining and construction; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

ARMENIA

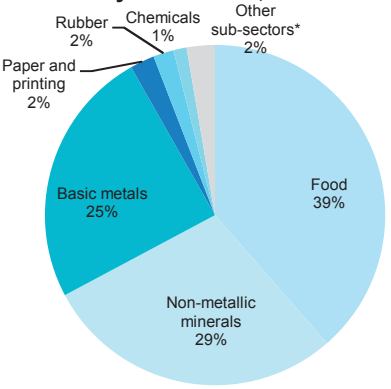
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2015	10	10	5	23	2	4
2016	9	8	6	23	3	4

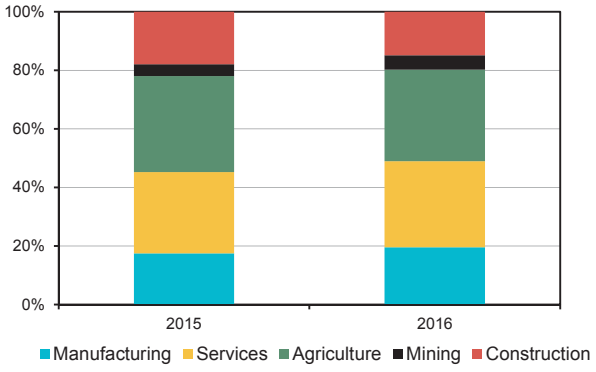
Industry and services energy consumption



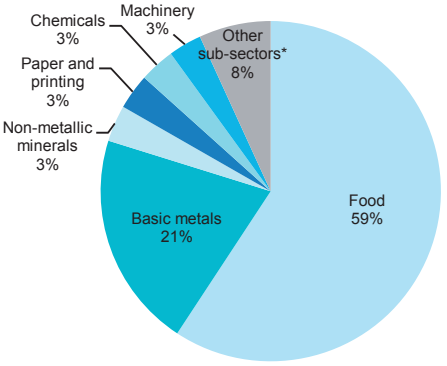
Manufacturing energy consumption by sub-sector, 2016



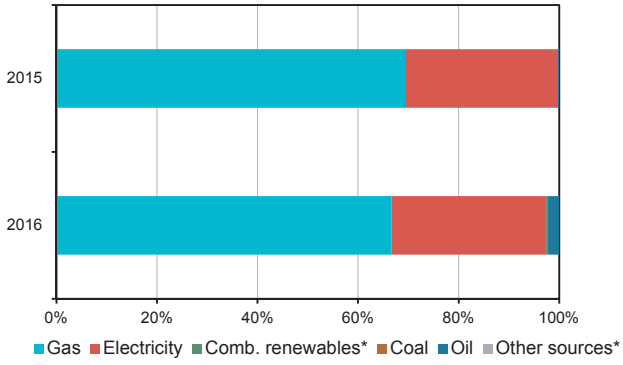
Value added** by sector



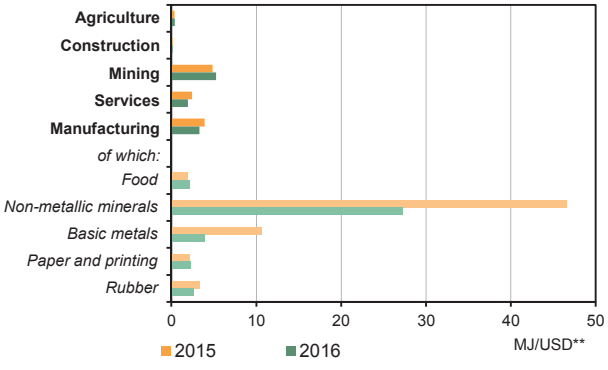
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities



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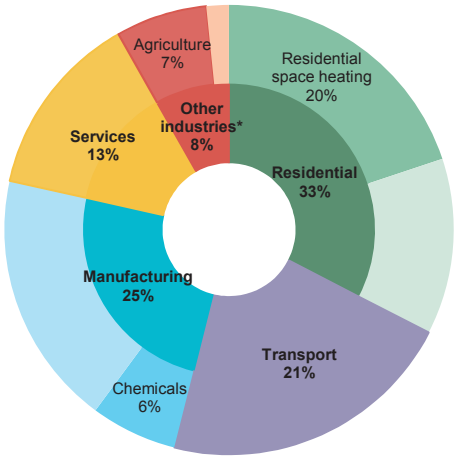
**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

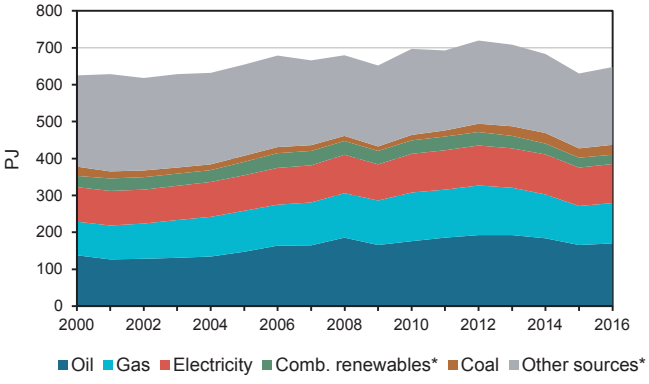
BELARUS

Cross-sectoral overview

Largest end-uses by sector, 2016



Final energy consumption by source



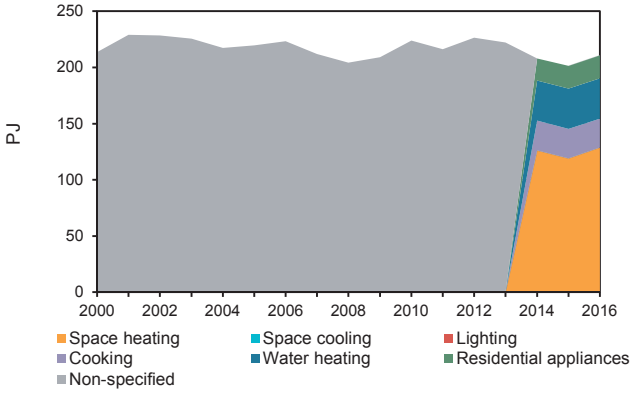
*Other industries includes agriculture, mining and construction; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

BELARUS

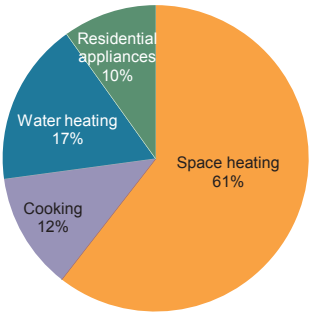
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)	Average dwelling occupancy (pers/dw)
2014	208	32	9	22	59	2.2
2016	211	34	10	22	59	2.2

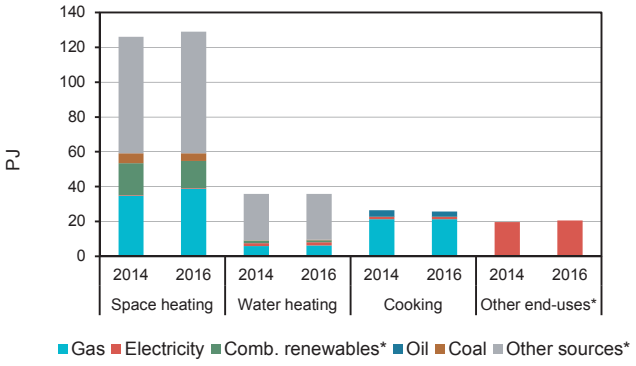
Residential energy consumption by end-use



Residential energy consumption by end-use, 2016



Residential energy consumption by source



Energy intensities by end-use per floor area

Energy intensities by end-use per dwelling

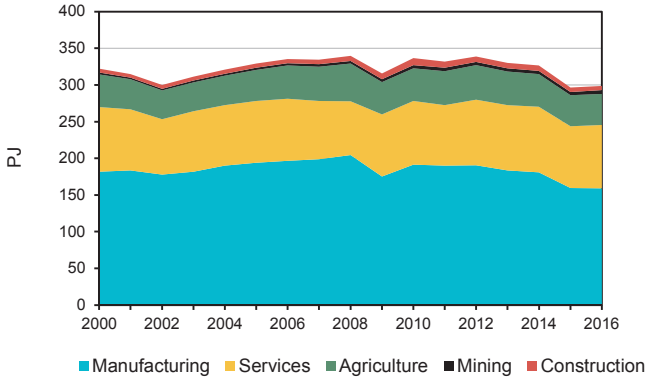
*Share of fossil fuels includes only the direct use of oil, gas and coal; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources; TC refers to temperature correction, for more information please refer to the explanatory notes.

BELARUS

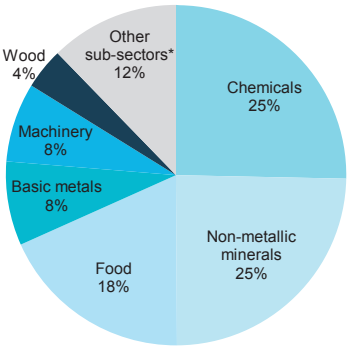
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2014	181	90	56	167	32	83
2016	159	86	53	156	30	80

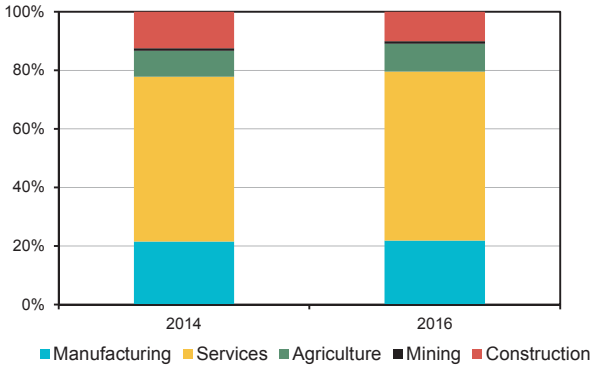
Industry and services energy consumption



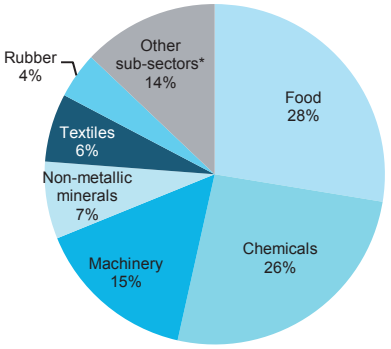
Manufacturing energy consumption by sub-sector, 2016



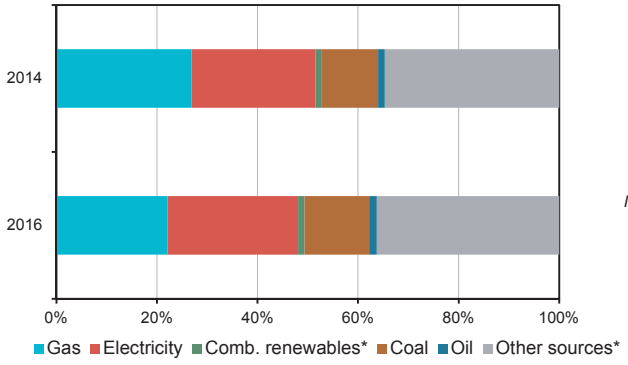
Value added** by sector



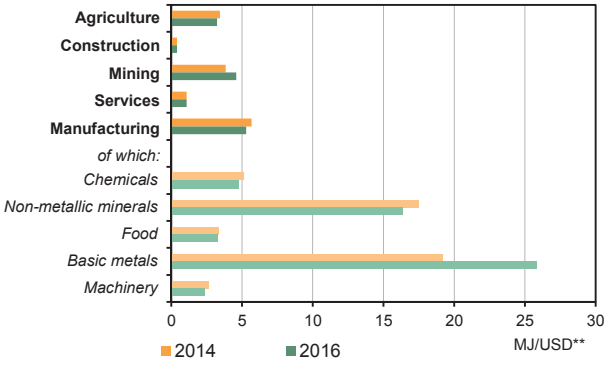
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities

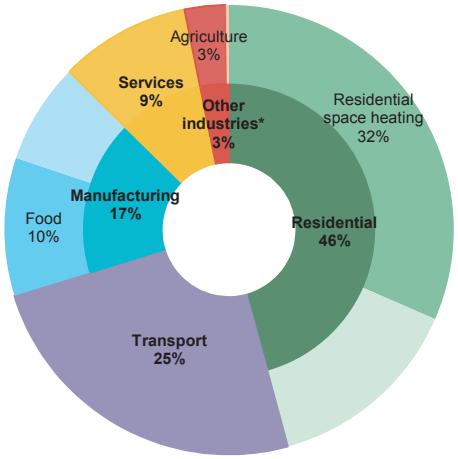


*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2014; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

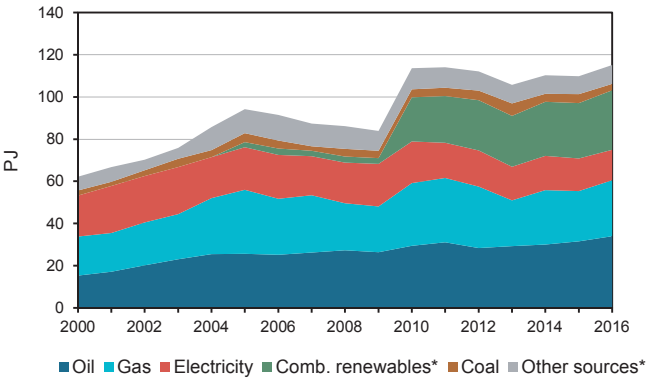
REPUBLIC OF MOLDOVA

Cross-sectoral overview

Largest end-uses by sector, 2016



Final energy consumption by source



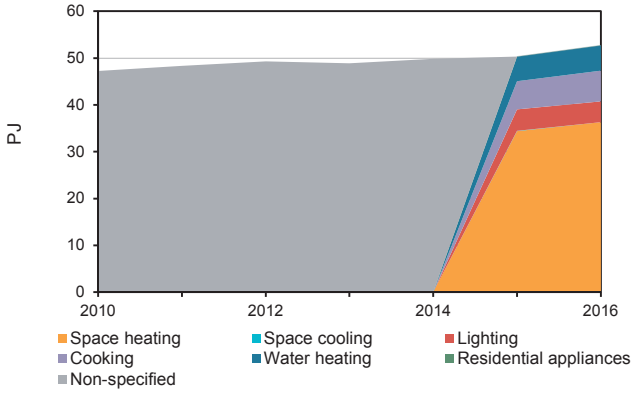
*Other industries includes agriculture, mining and construction; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

REPUBLIC OF MOLDOVA

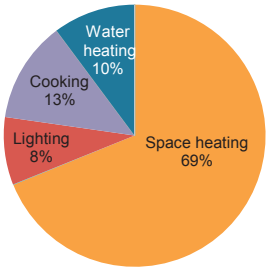
Residential sector

	Residential consumption (PJ)	Share of fossil fuels* in space heating (%)	Population (million)	Consumption per capita (GJ/pers)	Average dwelling surface (m²)**	Average dwelling occupancy (pers/dw)
2015	50	20	4	14	62	2.7
2016	53	19	4	15	62	2.7

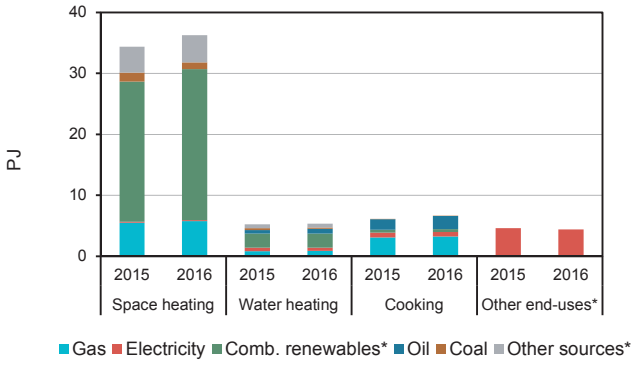
Residential energy consumption by end-use



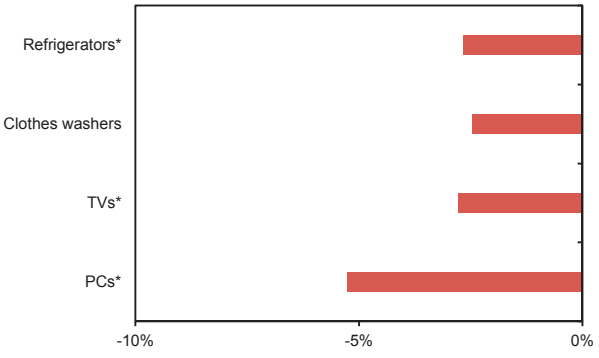
Residential energy consumption by end-use, 2016



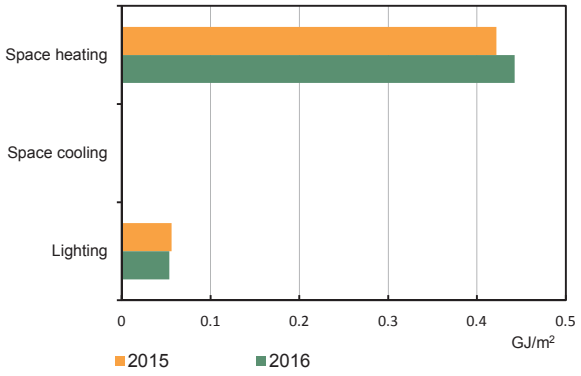
Residential energy consumption by source



Appliances per dwelling, 2015-16 % change**



Energy intensities by end-use per floor area



Energy intensities by end-use per dwelling**

*Share of fossil fuels includes only the direct use of oil, gas and coal; refrigerators includes also freezers and refrigerator-freezer combinations; TVs includes also home entertainment; PCs includes also other information technology; other end-uses includes space cooling, lighting, residential appliances and non-specified; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

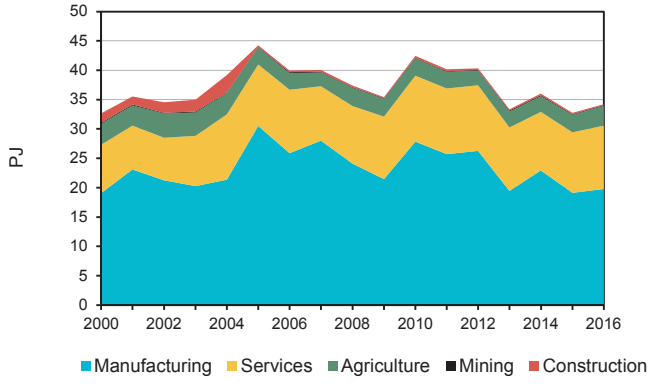
** Calculations based on all dwellings instead of only occupied dwellings.

REPUBLIC OF MOLDOVA

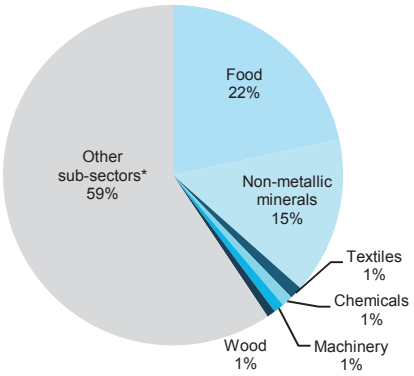
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2015	19	10	3	7	0.5	NA
2016	20	11	4	7	0.5	NA

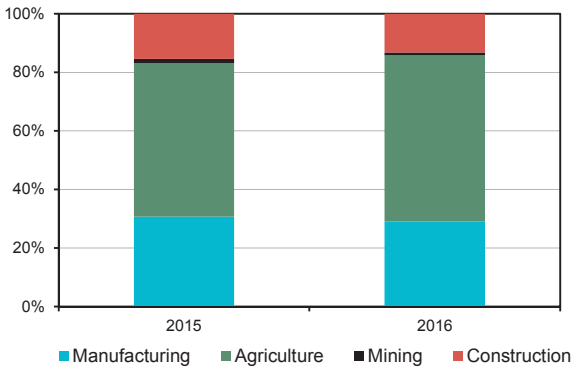
Industry and services energy consumption



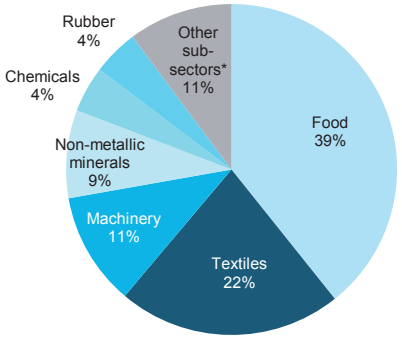
Manufacturing energy consumption by sub-sector, 2016



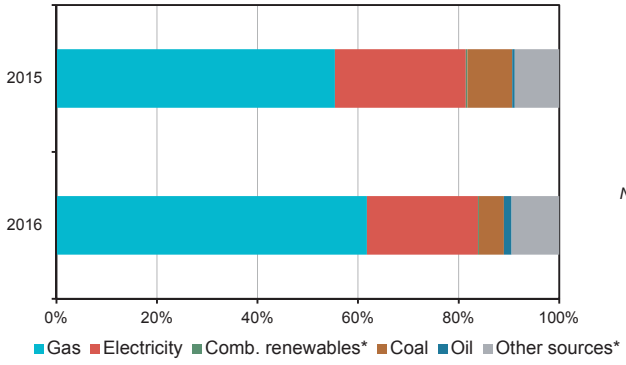
Value added** by sector



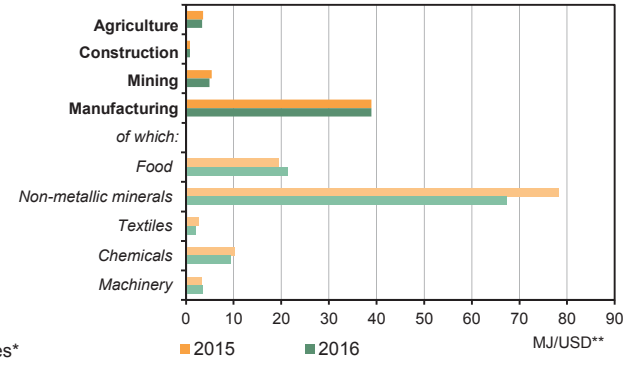
Manufacturing value added** by sub-sector, 2016



Manufacturing energy consumption by source



Selected energy intensities

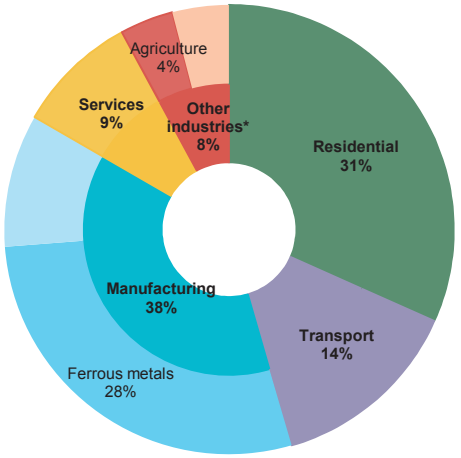


*Other industries includes agriculture, mining and construction; other sub-sectors includes all remaining manufacturing sub-sectors beyond the top-6; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.
**GDP and VA are at the price levels and PPPs of year 2015; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

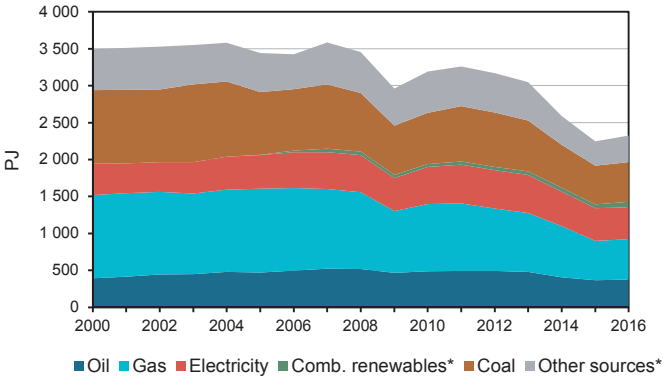
UKRAINE

Cross-sectoral overview

Largest end-uses by sector, 2016



Final energy consumption by source



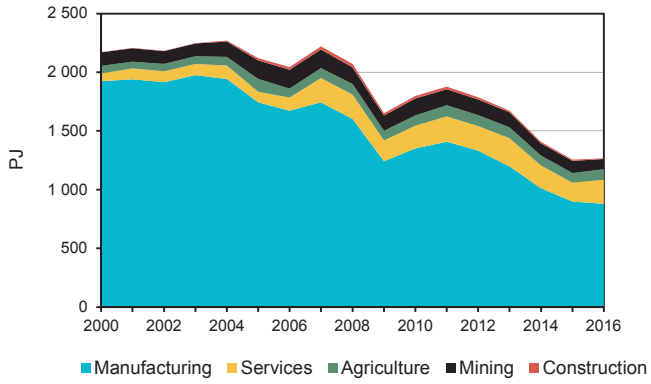
*Other industries includes agriculture, mining and construction; comb. renewables includes combustible renewables and waste; other sources includes heat and other energy sources.

UKRAINE

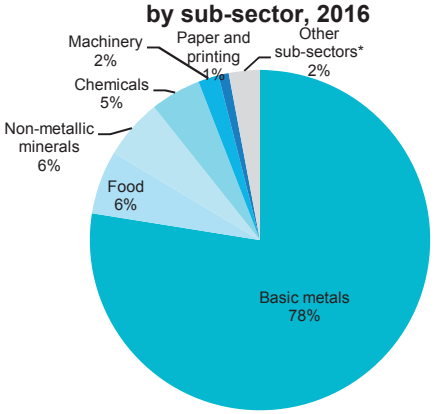
Industry and Services sectors

	Manufacturing consumption (PJ)	Services consumption (PJ)	Other industries* consumption (PJ)	GDP PPP** (billion USD)	Manufacturing VA** (billion USD)	Services VA** (billion USD)
2014	1 013	195	199	347	39	76
2016	880	203	184	321	34	72

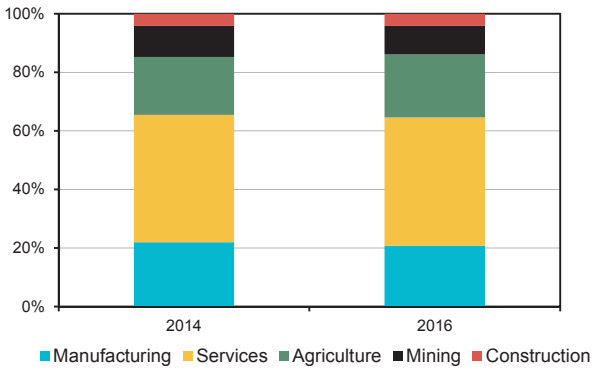
Industry and services energy consumption



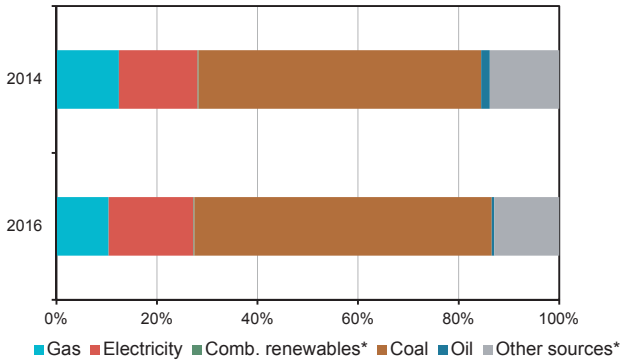
Manufacturing energy consumption by sub-sector, 2016



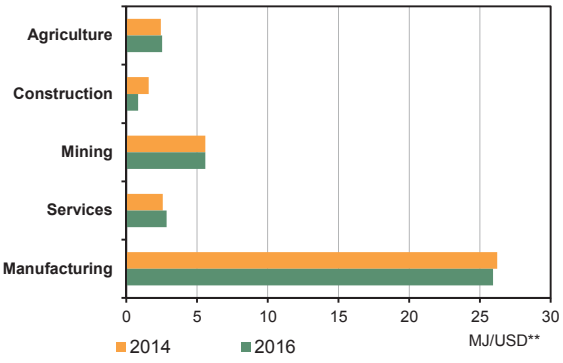
Value added** by sector



Manufacturing energy consumption by source



Selected energy intensities



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**GDP and VA are at the price levels and PPPs of year 2010; GDP = gross domestic product; VA = value added; PPP = purchasing power parity.

PART III

EXPLANATORY NOTES

1. ABBREVIATIONS AND ACRONYMS

MJ:	megajoule (10^6 joules)
GJ:	gigajoule (10^9 joules)
PJ:	petajoule (10^{15} joules)
EJ:	exajoule (10^{18} joules)
CO_2:	carbon dioxide
Comb.:	combustible
LPG:	liquefied petroleum gases
Gas:	natural gas
m^2:	square metre
pers:	person
pass.:	passenger
dw:	dwelling
PCs:	personal computers and information technologies
TVs:	televisions and home entertainment
TC:	temperature corrected
HDD:	heating degree days
CDD:	cooling degree days
USD:	United States dollar
GDP:	gross domestic product
PPP:	purchasing power parity
VA:	value added
pkm:	passenger-kilometres
tkm:	tonne-kilometres
NA:	not available or confidential

2. METHODOLOGICAL NOTES

The IEA energy efficiency indicators data collection

In 2009, IEA Members committed to collect energy efficiency indicators data through a new annual questionnaire. The questionnaire collects energy consumption and activity data for various end-uses, sub-sectors and modes/vehicle types across the four sectors: residential, services, industry and transport. The questionnaire is available online at the IEA energy efficiency statistics web page: www.iea.org/statistics/topics/energyefficiency/.

The IEA also developed a manual on energy efficiency data and indicators, *Energy Efficiency Indicators: Fundamentals on Statistics*; and one on how to use indicators to inform policies, *Energy Efficiency Indicators: Essentials for Policy Making*, both of which can be downloaded from the above IEA web page.

Notes on data quality

The analysis of demand-side energy efficiency trends requires highly disaggregated end-use energy data across the sectors of final consumption: residential, services, transport and industry. Examples of such disaggregated data include energy consumption by end-use (space heating, cooking, appliances, etc.) for the residential sector; or energy consumption by mode/vehicle type (passenger cars, motorcycle, freight trucks, etc.) for transport. Deriving energy efficiency indicators also requires consistent "activity data" covering the wide range of activities specific to each sub-sector/end-use, such as floor area, passenger-kilometres, production of key manufacturing output (cement, aluminium, iron, etc.), number of employees in each service category, etc.

While almost all countries have developed energy statistics to produce national energy balances, more disaggregated end-use energy and activity data are not always as readily available. Therefore, the development of energy efficiency indicators generally requires additional efforts, such as mapping the different available data through administrative sources, setting up new data collections; but also establishing new institutional arrangements to share and manage the different data.

The IEA end-use data collection agreed in 2009 is still work in progress, with developing quality and coverage across Member countries. Currently, IEA countries generally have relatively detailed data for the industry sector thanks to well established data collections to develop energy balances. Relatively important progress has been observed in the coverage of the residential sector, while detailed data for the services sector still remains unavailable for most countries. The availability of transport data varies greatly across countries, with activity data (passenger-kilometres, tonne-kilometres, vehicle stock etc.) often requiring additional development.

Furthermore, as indicators are calculated as a ratio of energy consumption and corresponding activity, and since the various data may not be collected by the same institution, the data quality assessment is particularly important. For example, consistency of boundaries and definition between energy and activity data is essential to create meaningful indicators, and to analyse their trends. Data users should also be aware that small changes in intensities may be caused by uncertainty in measurement of energy or activity data, and thus weight should be given to long-term trends. Other important validation criteria include internal consistency, consistency with external data sources, and

plausibility (values of indicators need to fall within expected ranges to be meaningful).[1]

The IEA Secretariat is continuously working with Member countries to improve the overall quality of the energy efficiency indicators database, including its consistency with the data provided by national administrations to develop the IEA energy balances and with the data reported by other organisations. We expect to keep improving data quality over time, and are grateful for the feedback to this publication received from the different data providers and data users.

Definitions of products

Oil

Oil includes crude oil, natural gas liquids, refinery feedstocks, additives as well as other hydrocarbons (including emulsified oils, synthetic crude oil, mineral oils extracted from bituminous minerals such as oil shale, bituminous sand, etc., and oils from coal liquefaction), refinery gas, ethane, LPG, aviation gasoline, motor gasoline, jet fuels, kerosene, gas/diesel oil, fuel oil, naphtha, white spirit, lubricants, bitumen, paraffin waxes, petroleum coke and other oil products.

Graphs shown for the transport sector in this publication present the disaggregation of the oil products described below.

Motor gasoline

Motor gasoline is light hydrocarbon oil for use in internal combustion engines such as motor vehicles, excluding aircraft. Motor gasoline is distilled between 35°C and 215°C and is used as a fuel for land based spark ignition engines. Motor gasoline may include additives, oxygenates and octane enhancers, including lead compounds such as TEL (tetraethyl lead) and TML (tetramethyl lead). In this publication and differently from the IEA energy balances, motor gasoline for transport includes liquid biogasoline or ethanol.

Diesel

Diesel includes diesel oil for fuel use in compression ignition (diesel) engines fitted in road vehicles. Distillation range is 160°C to 380°C. In this publication and differently from the IEA energy balances, diesel for transport includes liquid biodiesels.

LPG

LPG are light paraffinic hydrocarbons derived from refinery processes, crude oil stabilisation plants and natural gas processing plants. They consist mainly of propane (C_3H_8) and butane (C_4H_{10}) or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG are normally liquefied under pressure for transportation and storage.

Coal

Coal includes all coal, both primary (including hard 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), as well as peat (including peat products) and oil shale.

Gas

Gas includes natural gas (excluding natural gas liquids).

Combustible renewables and waste

Combustible renewables and waste comprises solid biofuels, liquid biofuels, biogases, industrial and municipal wastes. Combustible renewables and waste data are often based on incomplete information, with particularly high caution on data quality.

Solid biofuels are defined as any plant matter used directly as fuel or converted into other forms (e.g. charcoal) before combustion. This covers a multitude of woody materials generated by industrial process or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, sulphite lyes also known as black liquor, animal materials/wastes and other solid biofuels).

Liquid biofuels include biogasoline, biodiesel and other liquid biofuels. Liquid biofuels consumed in the transport sector are included, in this publication, under motor gasoline and diesel.

Biogases comprise landfill gas, sewage sludge gas and other biogases from anaerobic fermentation.

Note that biofuels refer only to the amounts of biomass specifically used for energy purposes. Therefore, the non-energy use of biofuels is null by definition.

Municipal waste consists of products that are combusted directly to produce heat and/or power and comprises waste produced by households, hospitals and the tertiary sector that are collected by local authorities for incineration at specific installations.

1. For a more comprehensive discussion of validation criteria by sector, please see the chapter on *Data validation* in *Energy Efficiency Indicators: Fundamentals on Statistics*: http://www.iea.org/publications/freepublications/publication/IEA_EnergyEfficiencyIndicatorsFundamentalsonStatistics.pdf.

Industrial waste of non-renewable origin consists of solid and liquid products (e.g. tyres) combusted directly, usually in specialised plants, to produce heat and/or power.

Electricity

Electricity includes electricity generated from all sources.

Other sources

Other sources includes heat, the direct use of geothermal (excluding geothermal heat pumps) and of solar thermal heat. Heat refers to heat produced for sale.

For some countries, this category could include some of the products mentioned above. For country-specific information, please refer to the chapter on *Country notes*.

Definitions of end-uses/ sub-sectors

Residential sector

Residential includes energy consumed by all households excluding fuel and electricity used by households for transport. The different end-uses within the residential sector are described below.

Space heating

Space heating includes the different means of heating spaces, which can be achieved through many systems and fuels. Heating systems can broadly be separated into two types, namely central heating and dedicated area/room heating. Central heating systems can heat the entire dwelling; they include hot water and steam systems with radiators, floor or wall furnaces, district heating, heat pumps, etc. Area-dedicated heating systems can be divided into several categories: standalone electric heaters, fireplaces, and stand-alone stoves using oil products or other fuels, such as coal or wood. It is not rare that households use a combination of several systems, e.g. electrical heaters to complement insufficient base central systems. Heating systems can generate heat using a number of energy sources such as electricity, natural gas, coal, fuel oil, liquefied petroleum gas (LPG), kerosene, biofuels, and solar energy.

Space cooling

Space cooling includes all equipment used for cooling a living area, which can be divided into two broad categories: central cooling systems and room-dedicated systems. Central air conditioners feed into a duct system that could also be used by a central heating system. Wall air conditioners and split systems are used to cool a room. There are other possible cooling systems such as swamp coolers (or evaporative coolers), which cool air through evaporation of water; heat pumps that can be used in reverse mode to cool the air or district cooling. Most of the cooling systems in the residential sector run exclusively on electricity.

Water heating

Water heating, also known as domestic hot water, includes systems that are used for heating water for showers, bathing, washing, etc. A number of tank-based or tankless systems can be used to heat the water. Water heating can be produced alone or in combination with space heating systems. The main energy sources used by water heating systems include natural gas, LPG, electricity, biofuels and, increasingly, solar thermal energy in a growing number of countries.

Cooking

Cooking includes energy consumed to cook meals using a wide range of stoves, from advanced induction stoves to traditional three-stone stoves. A number of energy sources are used for cooking such as natural gas, electricity, biofuels, LPG, kerosene and coal. Beside stoves, ovens are also included in the energy consumption for cooking. Cooking appliances such as toasters and microwave ovens, due to the difficulty in separating their respective consumption, are normally reported under other appliances.

Lighting

Lighting includes energy consumed for interior or exterior lighting of dwellings today mainly powered by electricity. Incandescent lamps, which have been around for more than a century, are slowly being replaced by more efficient fixtures, e.g. fluorescent tubes, compact fluorescent lamps and LEDs (light-emitting diodes). More and more countries are passing regulations to phase out the use of incandescent bulbs. Households that do not have any access to electricity still rely on traditional forms of lighting such as kerosene and LPG lamps, and sometimes even candles and flashlights. Moreover, off-grid solar applications for lighting may become more prominent in the future.

Residential appliances

Residential appliances encompasses two main categories: large (or major) appliances (sometimes also called white appliances or white goods) and other

(usually much smaller) appliances. In this publication, residential appliances are disaggregated as below:

- Refrigerators, also including freezers and refrigerators/freezers combinations;
- Dish washers;
- Clothes washers;
- Clothes dryers;
- TVs, also including home entertainment devices;
- PCs, also including other information technology devices;
- Other appliances, including all appliances not specified above, such as phones, hair driers, microwaves, vacuum cleaners etc. For country specific information, please refer to the chapter on *Country notes*.

In this publication, for energy consumption, dish washers, clothes washers and clothes dryers may be presented jointly as washing equipment.

Non-specified

Non-specified includes all consumption for energy uses that are not specified above. For some countries, this category could also include data from end-uses listed above. For country specific information, please refer to the chapter on *Country notes*.

Industry sector

Manufacturing

It includes all the manufacturing subsectors listed below [ISIC Division 10 to 18 and 20 to 32]. Manufacture of coke and refined petroleum products [ISIC Division 19] is excluded from this publication.

Food includes manufacture of food, beverages and tobacco [ISIC Divisions 10 to 12];

Textiles includes manufacture of textile, wearing apparel and leather [ISIC Divisions 13 to 15];

Wood includes wood and products of wood and cork (other than pulp and paper) [ISIC Division 16];

Paper and printing includes paper, pulp and printing [ISIC Divisions 17 and 18];

Chemicals includes chemicals, and chemical and pharmaceutical products [ISIC Divisions 20 and 21] excluding petrochemical feedstocks;

Rubber includes manufacture of rubber and plastics products [ISIC Division 22]. If not available may be included under non-specified manufacturing;

Non-metallic minerals includes non-metallic minerals such as glass, ceramic, cement, etc. [ISIC Division 23];

Basic metals includes manufacture and casting of ferrous metals and non-ferrous metals [ISIC Division 24];

- **Ferrous metals** covers manufacture and casting of Iron and steel including energy used in blast furnaces and coke ovens [ISIC Class 2410 and Class 2431];
- **Non-ferrous metals** includes manufacture and casting of non-ferrous metals (e.g. aluminium) [ISIC Class 2420 and Class 2432];

Machinery includes machinery: fabricated metal products, machinery and equipment other than transport equipment [ISIC Divisions 25 to 28];

Transport equipment [ISIC Divisions 29 and 30];

Other manufacturing includes the manufacture of furniture and other manufacturing (e.g. jewellery) [ISIC Division 31 and 32]; and non-specified manufacturing.

Other industries

It includes agriculture, mining and construction.

Agriculture includes agriculture, forestry and fishing [ISIC Division 01 to 03];

Mining covers mining and quarrying including coal, oil and gas extraction [ISIC Division 05 to 09];

Construction [ISIC Divisions 41 to 43].

Services sector

Services sector includes services and the commercial sector [ISIC Division 33, 37-39, 45-47, 52, 53, 55, 56, 58-66, 68-75, 77-82, 84 (excluding Class 8422), 85-88, 90-96 and 99].

Transport sector

Transport covers all transport modes using commercial energy, independently of the sector where the transport activity occurs. As a consequence, cycling, walking or sailing are not covered in this sector, even though these modes could represent sizeable activities in terms of passenger-kilometres (pkm).

Transport excludes international marine and aviation bunkers, pipeline transportation, and when possible fuel tourism.

The transport sector is divided by segment (passenger and freight), mode (road, rail, air and water) and by vehicle type (e.g. cars, motorcycles, etc).

Road transport

It includes passenger and freight road transportation, as listed below.

Passenger cars includes passenger light-duty vehicles carrying up to eight persons, cars, minivans, sport utility vehicles and personal-use pickup trucks. [1] Passenger cars cover a number of categories, such as taxis; hire cars, ambulances and motor homes.

Buses includes urban, suburban and intercity mini-coaches, trolleybuses, minibuses and bus vehicles.

Motorcycles includes powered 2- to 4-wheeled road motor vehicles not exceeding 400 kilograms.

Freight road transport covers the movement of goods within the national boundaries by road vehicles designed, exclusively or primarily, to carry goods: light duty freight vehicles (vans and pickups), heavy-duty goods vehicles (trucks or lorries), road tractors, and agricultural tractors permitted to use roads open to public traffic.

Rail transport

It includes passenger and freight trains transportation.

Passenger trains includes any movement of passengers through railway, on a given railway network, regional, urban or suburban, within the national boundaries. Passenger rail transport includes trains, metro vehicles and trams (streetcars). Rail transport can be powered by electricity, diesel or steam.

Freight trains includes any movement of goods by railway vehicles on a given railway network, regional, urban or suburban, within the national boundaries. Rail transport can be powered by electricity, diesel or steam.

Air transport

It includes domestic passenger and freight airplanes.

Passenger airplanes includes passenger airplanes, aircrafts configured for the transport of passengers, used for domestic travels. For country-specific coverage, please refer to the chapter on *Country notes*.

Freight airplanes covers the movement of goods by aircrafts configured for the transport of freight or mail, operating within the national boundaries. For country-specific coverage, please refer to the chapter on *Country notes*.

Water transport

It includes domestic passenger and freight ships and excludes fuel used for ocean, coastal and inland fishing (included under agriculture) and military consumption.

Passenger ships covers the movement of passengers, by any kind of vessel, boat or ship, undertaken at sea, or on lakes and rivers, within the national boundaries. International water transport is excluded from national totals, while inland waterways transport is included. For country-specific coverage, please refer to the chapter on *Country notes*.

Freight ships covers the movement of goods by any kind of vessel, boat, barge or ship, undertaken at sea, or over lakes and rivers, within the national boundaries. International water transport is excluded from national totals, although it has been the largest carrier of freight throughout recorded history. For country-specific coverage, please refer to the chapter on *Country notes*.

Definitions of activity data

Residential sector

Population

Dwellings includes only primary residences excluding unoccupied dwellings and secondary residences.

Residential floor area (surface) includes only floor area of occupied dwellings.

Industry sector

Value added in USD at the price level and purchasing power parities (PPPs)[2] of the year 2010.

Services sector

Value added in USD at the price level and PPPs of the year 2010.

1. For some countries, pick-up trucks are reported either in passenger transport or freight transport according to their main use. For country-specific information, please refer to the chapter on *Country notes*.

2. Purchasing power parities are the rates of currency conversion that equalise the purchasing power of different currencies.

Transport sector

Passenger-kilometres (pkm) is a unit of measure of passenger transport activity. One passenger-kilometre represents the transport of one passenger over one kilometre. For all vehicles, it is the total distance travelled of all passengers summed up.

Tonne-kilometres (tkm) is a unit of measure of goods transport activity. One tonne-kilometre represents the transport of one tonne over one kilometre. For all vehicles, it is the total distance travelled of all tonnes summed up.

Vehicle-kilometres (vkm) is a unit of measure of vehicle activity. One vehicle-kilometre represents the movement of a vehicle over one kilometre. For all vehicles, it corresponds to the product of the number of vehicles in stock and the average distance travelled by vehicle.

Occupancy (passenger per vehicle) represents the average number of passengers per vehicle. It can be calculated dividing pkm by vkm.

Load (tonne per vehicle) represents the average tonnes of goods transported by one vehicle. It can be calculated dividing tkm by vkm.

Comparability with the IEA energy balances

This publication is based on the IEA energy efficiency indicators data collection which is additional to that used for the IEA energy balances. Due to the emphasis on final end-uses across sectors, some differences occur between the final energy consumption in this publication and the total final energy consumption reported in the IEA energy balances, for the following reasons:

- In this publication, non-energy use is excluded from final energy consumption;
- Energy consumption in ferrous metals (part of basic metals and called iron and steel in the IEA balances) also includes energy consumption and losses in transformation for blast furnaces and coke ovens, which are accounted under the energy and the transformation sectors in the IEA energy balances;
- Energy consumption in mining also include energy consumed to extract oil, gas and coal;
- Transport excludes pipeline transportation and fuel tourism;
- Military energy consumption is excluded, while it is included in the total final energy consumption in the IEA Energy Balances under the other non-specified category.

Besides these systematic differences, some discrepancies might occur due to the higher data disaggregation of this publication, and to the need to adapt different approaches/methodologies (e.g. bottom-up vs top-down) to collect or estimate these data at a country level. Additionally, for some countries different offices/institutions are responsible for preparing the energy balances and the energy efficiency data shown in this publication, which may also lead to unintended discrepancies.

Estimates of CO_2 emissions by end-use

The estimates of CO_2 emissions from fuel combustion presented in this publication are calculated using the IEA energy efficiency database, the IEA energy balances and the default methods and emission factors from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories.*

This publication presents only CO_2 emissions from fuel combustion, from all reported energy uses of fuels, excluding emissions from non-energy use of fuels and including emissions reallocated from electricity and heat generation (using the same methodology as in the IEA (2018) *CO_2 emissions from fuel combustion* publication).

CO_2 emissions from fuel combustion

CO_2 = Fuel consumption * Emission factor,

where:

Fuel consumption = amount of fuel combusted,

Emission factor = implied emission factor, based on energy balances fuel mix within and default emission factors

Fossil fuel categories in the energy efficiency indicators template (coal, oil, gas) are more aggregated than those within the IEA energy balances. Country-

specific implied emission factor for oil, coal and gas are computed based on the mix of individual products reported within the IEA energy balances. Emissions are then summed across all fuel categories to obtain total emissions for a given end-use or sub-sector.

Emissions estimates could differ from those published in the IEA (2018) *CO_2 emissions from fuel combustion* publication mainly because the energy consumption data may differ from the IEA energy balances (see previous section). Also, the IEA Secretariat estimates of CO_2 emissions from fuel combustion may differ from the figures that a country submits to the UNFCCC for a variety of reasons.

Temperature correction[1]

The amount of energy required for space heating (and space cooling) is highly dependent on the ambient temperature, and this impact on energy consumption may easily mask the effects of energy efficiency improvements. For example, a country may dramatically reduce the amount of energy needed for space heating over a year simply due to an exceptionally warm winter. The opposite may also be true. The reduction in energy consumption due to the energy efficiency improvements in heating systems may be offset by an extra energy demand due to an extremely cold winter.

Therefore, in order to accurately monitor the evolution of energy consumption for space heating in the residential sector (in this publication services' space heating is not temperature corrected) over time, it is essential to eliminate the impact of temperature variations and to analyse temperature-corrected data. In this publication one of the most common methods has been adopted for such correction, namely the use of heating degree days (HDD).

HDD are a simplified measure of the intensity and duration of cold weather over a certain period in a given location. The value of HDD for a period, for example a winter, is determined by subtracting for each day the average daily temperature from a base temperature (assumed to be the temperature below which heating systems are turned on), and then adding up this difference for the days of the period for which the average outside air temperature is lower than the base temperature. When the outside air temperature is equal to or higher than the base temperature, HDD are zero. The higher heating degree days, the colder the season, the greater the amount of energy required for space heating. HDD can be defined as:

Heating degree days

$$HDD = \sum_{k=1}^{n} (T_{base} - T_k)$$

$$T_{base} > T_k,$$

where:

T_{base} is the base temperature,

T_k is the average temperature of day k,

n is the total number of days in the given period.

As noted above, two factors are key for the calculation of HDD. The first is the base temperature, which should be set at the level of outside air temperature at which residents of a given region tend to turn on their heating systems. This level can vary across different regions depending on many factors, such as the ability to tolerate cold temperatures, the variety of building types, the thermal properties of buildings, the density of occupants, etc. For example, the base temperature in the United Kingdom is typically 15.5°C while in the United States it is typically 65°F (equivalent to 18°C). The base temperature should be carefully determined based on the characteristics of the region, since this choice will impact the temperature correction of the energy consumption data. It may also evolve in time, for example if people already turn on their thermostat at higher outside temperatures.

The second factor is the time series of average daily temperatures. For example, if the average temperature on one day is 5 degrees below the base temperature, there are five HDD for that day. To get the annual number of HDD, all positive values of HDD are summed for each day in the year.

When the national HDD figures are available, the data of energy consumption for space heating can be corrected for temperature variations. This publication uses a simplified methodology, which assumes that the elasticity for adjusting heating requirements is 1, as shown below:

1. See Annex C *in Energy Efficiency Indicators: Fundamentals on Statistics*.

Temperature correction

$$Energy_{TCi} = Energy_{actual\ i} * \frac{HDD_{period\ average}}{HDD_{year\ i}},$$

where:

$Energy_{TCi}$ is the temperature-corrected energy consumption for the year *i*,

$Energy_{actual\ i}$ is the actual energy consumption in year *i*,

$HDD_{period\ average}$ is the average heating degree days of the given period (2000-latest year), and

$HDD_{year\ i}$ is the total heating degree days in the year *i*.

Such correction intends to remove the fluctuations in energy consumption due to fluctuations in temperature in the given year compared with the average temperature of a country. For example, if a year has 500 HDD and the annual average HDD for the country is 250, the corrected energy consumption for space heating would be half of the actual energy consumption. Of course, comparison of space heating efficiency indicators across countries is still difficult as a country on average experiencing colder temperatures than another country will need on average to consume more to heat the same floor area.

Similarly, cooling degree days (CDD) are a measure of the intensity of warm weather to correct energy consumption data for space cooling. In this publication, temperature corrections are made only for calculating intensity indicators. Therefore, energy consumption data show the fluctuations due to temperature change. Space cooling is temperature corrected only for countries where CDD are data available.

Decomposition into drivers of final energy consumption

The IEA decomposition analysis aims at identifying the causes of changes in energy demand, by separating the role of activity and structural changes to isolate changes in energy intensity due to energy efficiency. As described below, this isolated change in energy intensity can then be used as a proxy for estimating energy efficiency improvements and is called the "efficiency effect". Three main factors are distinguished in the decomposition analysis (see Table 1), as presented below.

Activity is the level of action that drives energy use. It is broken into sectors and measured by appropriate data: value added output in the industry and services sectors; population in the residential sector; passenger-kilometres for passenger and tonne-kilometres for freight transport.

Structure reflects the mix of activity levels within a sector: the share of production represented by each sub-sector of industry or services; the floor area per person, number of dwellings per person and appliance ownership rates in the residential sector; and the modal share of vehicles in passenger and freight transport. Because different activity types have different energy intensities, shifts in the structure of activity affect energy demand.

Efficiency is the amount of energy used per unit of activity in each end-use or sub-sector. This publication uses the term "efficiency effect" to be distinguished from the term "energy intensity." The decomposition analysis is undertaken at the most disaggregated level possible with the available data, so that changes in energy intensity can be used as a proxy for energy efficiency.

In this publication, the Logarithmic Mean Divisia Index (LMDI) additive method has been used to perform the decomposition analysis.

This decomposition method is comparable to that used in the *Energy Efficiency 2018* (IEA, 2018), although some differences exist. These include the treatment of base years and assumptions used for the transport sector. Both publications use the Logarithmic Mean Divisia Index (LMDI) method, although *Energy Efficiency 2018* uses a rolling year decomposition, whereas this publication applies a fixed year approach.

On the passenger transport side, in this publication, intensities are calculated as energy per passenger-kilometre, whereas in *Energy Efficiency 2018* intensities are calculated as energy per vehicle-kilometre, decoupling the occupancy (passenger per vehicle) from the efficiency effect. These differences could lead to different estimated energy savings, although these are not expected to vary significantly.

Table. 1. Data and indicators included in the IEA decomposition analysis presented in this publication

Sector	End-use/sub-sector	Activity	Structure	Efficiency
Residential	Space heating	Population	Floor area / population	Temperature-corrected energy / floor area
	Water heating	Population	Occupied dwellings / population	Energy / occupied dwelling
	Cooking	Population	Occupied dwellings / population	Energy / occupied dwelling
	Space cooling	Population	Floor area / population	Temperature-corrected energy / floor area
	Lighting	Population	Floor area / population	Energy / floor area
	Appliances	Population	Appliance stock / population	Energy / appliance unit
Passenger transport	Passenger car; bus; rail; domestic aviation	Passenger-kilometre	Share of passenger-kilometres by mode	Energy / passenger-kilometre
Freight transport	Freight road transport; rail; domestic shipping	Tonne-kilometre	Share of tonne-kilometres by mode	Energy / tonne-kilometre
Manufacturing	Food; textiles; wood; paper and printing; chemicals; rubber; non-metallic minerals; basic metals; machinery; transport equipment; furniture / other manufacturing	Value added	Share of value added	Energy / value added
Services	Services	Value added	Share of value added	Energy / value added
Other industries	Agriculture; construction	Value added	Share of value added	Energy / value added

Notes on graphs

Cross sectoral overview

Largest end-uses by sector

It shows the share of energy consumption by sector (residential, transport, manufacturing, services and other industries), highlighting the largest energy consuming end-use/sub-sector within the residential, transport and industry sectors. Other industries includes agriculture and fishing, mining and construction.

Top-6 CO_2 emitting end-uses

It shows the shares of CO_2 emissions in total CO_2 emissions from final energy consumption for the largest six emitting end-uses/sub-sectors. Emissions include emissions reallocated from electricity and heat generation.

Final energy consumption by source

It shows the time series of final energy consumption by energy source.

Drivers of final energy consumption[1]

It shows the results of the IEA decomposition analysis of final energy consumption into drivers. The three dashed lines represent the activity, the structure and the efficiency effects that drive actual final energy consumption, shown as solid line.

Estimated energy savings from efficiency[1]

It shows the hypothetical energy consumption if no energy efficiency improvements since 2000 had occurred compared with the actual final energy consumption. The difference represents an estimate of the energy savings due to efficiency improvements since 2000.

Estimated cumulative energy savings by sector[1]

It shows the contribution of the different sectors (residential, industry and services, passenger transport and freight transport) to the overall cumulative energy savings resulting from the efficiency improvements since the year 2000 until the latest year available.

1. In the graphs presenting the results of the IEA decomposition analysis, the final energy consumption may be smaller than the actual final energy consumption if some end-uses/sub-sectors are excluded from the decomposition due to data availability. For any given country, please refer to the chapter on *Country notes*.

Residential sector

Residential energy consumption by end-use

It shows the time series of residential energy consumption by end-use. Residential end-uses include: space heating; space cooling; lighting; cooking; water heating; residential appliances; non-specified.

Residential energy consumption by end-use, latest year

It shows the share of each end-use in the residential energy consumption for the most recent available year.

Residential energy consumption by source

It shows consumption by end-use and energy source in the residential sector, for 2000 and for the most recent available year. In this graph, other end-uses include space cooling; lighting; residential appliances and non-specified.

Appliances per dwelling, 2000-latest year % change

It shows the percent change in the residential appliances diffusion, calculated as average number of units of appliances per dwelling, between 2000 and the latest year available.

Energy intensities by end-use per floor area

It shows selected end-use intensities calculated as temperature-corrected energy per floor area (GJ/m^2).

Energy intensities by end-use per dwelling

It shows selected end-use intensities calculated as energy per dwelling.

Industry and Services sectors

Industry and Services energy consumption

It shows the time series of energy consumption for manufacturing, services, agriculture, mining and construction.

Manufacturing energy consumption by sub-sector

It shows the shares of energy consumption in manufacturing for the top-six consuming sub-sectors, for the most recent available year.

Value added by sector

It shows the shares of value added in total GDP for manufacturing, services, agriculture, mining and construction, for 2000 and the most recent available year.

Manufacturing value added by sub-sector

It shows the share of value added in manufacturing for the top-six consuming sub-sectors, for the most recent available year.

Manufacturing energy consumption by source

It shows the shares of the different energy sources in manufacturing, for 2000 and for the most recent available year.

Selected energy intensities

It shows intensities calculated as energy per value added for agriculture, construction, mining, services and manufacturing; and for the largest five energy consuming manufacturing sub-sectors.

Transport sector

Note that transport excludes international marine and aviation bunkers, pipelines and fuel tourism.

Transport energy consumption by mode/vehicle type

It shows the time series of energy consumption split by road (passenger cars, buses, motorcycles, freight road), rail, air, water. Passenger cars includes cars, sport utility vehicles and personal trucks.

Transport energy consumption by mode/vehicle type, latest year

It shows the shares in transport energy consumption of the different modes/vehicle types: road (passenger cars, buses, motorcycles, freight road), rail, air, and water, for the most recent available year.

Energy consumption in road transport by source

It shows the share of different fuels (motor gasoline, diesel, LPG, natural gas and other) in passenger cars and freight road transport, for 2000 and for the most recent available year.

Transport activity by mode/vehicle type

It shows the share of each mode/vehicle type in activity for passenger transport (passenger-kilometres) and road transport (tonne-kilometres), for 2000 and the most recent available year.

Energy intensities for passenger transport

It shows intensities, calculated as energy per passenger-kilometre, for selected passenger transport modes/vehicles.

Energy intensities for freight transport

It shows intensities, calculated as energy per tonne-kilometre, for selected freight transport modes/vehicles.

3. UNITS AND CONVERSIONS

All the energy data reported in this publication are based on a **"net"** energy content, which excludes the energy lost to produce water vapour during combustion.

General conversion factors for energy

To:	TJ	Gcal	Mtoe	MBtu	GWh
From:	multiply by:				
terajoule (TJ)	1	2.388×10^{2}	2.388×10^{-5}	9.478×10^{2}	2.778×10^{-1}
gigacalorie (Gcal)	4.187×10^{-3}	1	1.000×10^{-7}	3.968	1.163×10^{-3}
million tonnes of oil equivalent (Mtoe)	4.187×10^{4}	1.000×10^{7}	1	3.968×10^{7}	1.163×10^{4}
million British thermal units (MBtu)	1.055×10^{-3}	2.520×10^{-1}	2.520×10^{-8}	1	2.931×10^{-4}
gigawatt hour (GWh)	3.600	8.598×10^{2}	8.598×10^{-5}	3.412×10^{3}	1

Conversion factors for mass

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

Conversion factors for volume

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

Decimal prefixes

10^{1}	deca (da)	10^{-1}	deci (d)
10^{2}	hecto (h)	10^{-2}	centi (c)
10^{3}	kilo (k)	10^{-3}	milli (m)
10^{6}	mega (M)	10^{-6}	micro (μ)
10^{9}	giga (G)	10^{-9}	nano (n)
10^{12}	tera (T)	10^{-12}	pico (p)
10^{15}	peta (P)	10^{-15}	femto (f)
10^{18}	exa (E)	10^{-18}	atto (a)

4. COUNTRY NOTES

IEA MEMBER COUNTRIES

GENERAL NOTES

The notes given in this section refer to data for the years 2000 to 2016 published in this book, as well as on the online data service.

Data are generally obtained from national administrations through annual submission of the energy efficiency indicators questionnaire. In case other sources are used, e.g. the Odyssee database, this is indicated in the relevant country sources section.

In case of estimates made by the IEA Secretariat, explanations of the estimates are provided in the respective country notes.

Australia

Sources

Australian Government, Department of the Environment and Energy.

Years covered

2000-2016.

General note

All energy data refer to the financial year (e.g. July 2015 to June 2016 for 2016). The macroeconomic activity data are of calendar year (e.g. January 2016 to December 2016 for 2016).There may be some discrepancies between the IEA energy efficiency indicators and the IEA energy balances data. Work is ongoing to improve consistency.

Residential sector

In this edition, data for residential energy consumption have been revised for all end uses.

Data for TVs include TVs only. Data for home entertainment are reported under other appliances.

Data for energy consumption of swimming pools and spas are included under other appliances. Data for energy consumption of natural gas for swimming pools and spas are included in other appliances, other energy sources.

Industry and services sectors

Data for energy consumption and value added of paper and printing [ISIC 17-18] also include wood [ISIC 16].

Data for energy consumption and value added for chemicals [ISIC 20-21] also include rubber and plastics [ISIC 22] and manufacture of coke and refined petroleum products [ISIC 19].

Data for energy consumption and value added for machinery [ISIC 25-28] includes transport equipment [ISIC 29-30].

Data for value added for other manufacturing are not available.

Transport sector

Data for passenger-kilometres of passenger cars has been revised in this edition of the publication, leading to slightly higher intensities for this mode.

Data for energy consumption of motorcycles has been revised since 2012, and may present a break for this year.

Austria

Sources

Austrian Energy Agency; Odyssee database.

Years covered

2000-2016.

General note

There are some discrepancies between the IEA energy efficiency indicators and the IEA energy balances databases. Work is ongoing to improve data consistency.

Residential sector

Data on end use energy consumption for the residential sector has been revised after the year 2012, following a new survey for the services sector. Part of residual energy consumption has been reallocated to the residential sector. This may lead to some breaks in the time series. Work is in progress to align new and historical data, and different data sources.

Data for stocks of PCs are not available.

Data on energy consumption for space cooling and per appliance type, and data on appliances stocks and diffusion for the year 2016 are based on IEA Secretariat estimates.

Industry and Services sectors

Data on end use energy consumption for the services sector has been revised after the year 2012, following a new sectoral survey. Part of residual energy consumption has been reallocated to the residential sector. This may lead to some breaks in the time series. Work is in progress to align new and historical data, and different data sources.

The data for value added of total manufacturing, and specifically for basic metals (ISIC 24), show a significant decrease in 2009, leading to a considerably higher intensity in that year. This does not necessarily reflect physical intensities, as it is based on economic data.

Transport sector

Data for energy consumption and activity (passenger-kilometres and tonne-kilometres) of freight airplanes and passenger ships are not available. Their energy consumption might be partially included under passenger airplanes and freight ships data, respectively.

Revisions in the data for activity (passenger-kilometres) of domestic passenger airplanes led to changes in the energy intensities of this transport mode.

Belgium

Sources

Direction générale Energie – Ministry of Energy; Odyssee database.

Years covered

2000 (partially) – 2016.

General note

Results of the IEA decomposition are not available.

Residential sector

The data for the residential sector are undergoing major revisions; hence at the time of this publication end use data was only available for the year 2016. Work is ongoing to improve the coverage of end use data series.

Data for energy consumption of residential appliances include lighting.

Data for energy consumption of residential appliances is available only as a total included under other appliances.

Industry and Services sectors

Data for value added of several industry sub-sectors for the year 2016 are based on estimates from the IEA Secretariat.

Some data for energy consumption from natural gas and electricity for some industry subsectors are based on IEA estimates.

Data for energy consumption for cement production for the year 2016 are not available.

Transport sector

Activity data (passenger-kilometre) for passenger transport for the year 2016 are IEA Secretariat estimates, and data for freight loads (tonnes carried) are not available for the full time series.

Data on electricity consumption in passenger trains includes trams, while activity data (passenger-kilometre)

does not. Indicators should be considered carefully in this sense.

There is a break in 2011 on the consumption of diesel and light fuel oil data for freight trains, which is under investigation, and may be subject to revisions in the future.

Data on energy consumption for domestic freight airplanes and domestic passenger ships are not available; it may be partially included in domestic passenger airplanes and domestic freight ships, respectively.

Canada

Sources

Natural Resources Canada, Statistics Canada.

Years covered

2000-2016.

General notes

Differences between the IEA energy efficiency indicators and the IEA energy balances result from different timing of reporting requirements, sources used, as well as definitions and scope of coverage. Work is ongoing to align the two databases.

Detailed energy use information for Canada is available from Canada's National Energy Use Database: http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/home.cfm.

Industry and Services sectors

There were some revisions of energy consumption data for some industry subsectors, in this edition of the publication.

Data reported in some fuel categories has been combined with other fuels, due to confidentiality issues. For example, energy consumption from electricity and renewables and waste are combined in the food [ISIC 10-12] subsector.

The energy consumption for the non-metallic minerals [ISIC 23] for the years 2014 and 2015, as well as other some data points for energy consumption from oil products, coal, heat and electricity of ISIC 23, were estimated by the IEA Secretariat.

Data for energy consumption from oil products and natural gas for paper production are based on IEA Secretariat estimates.

Data for value added for Canada are based on price levels of 2007, instead of 2010 as for other countries.

Transport sector

Data for buses include urban/local light rails (metro trains, light trains and urban buses).

Data on the energy use for air transport include both domestic and international transport. The energy use and activity data for water transport include domestic and trans-border, but exclude other international transport.

Differences in road transport between the IEA energy efficiency indicators database and the IEA energy balances may be due to reallocation of energy consumption from motor gasoline and diesel between the services and the transport sector, with an impact on both sectors data consistency.

Czech Republic

Sources

Czech Statistical Office and Ministry of Industry and Trade; Odyssee database.

Years covered

2000-2016.

Residential sector

Data for energy consumption for space cooling are available from 2015 onwards.

Data on end use energy consumption has been collected based on a new methodology (a new residential survey) for the year 2016. This led to revisions in some data series (e.g. lighting), with implications on the respective intensities.

The revisions made also led to breaks for 2015 and 2016 (e.g. refrigerators, freezers and clothes dryers) on energy consumption data, and also on appliances stocks data.

Data on energy consumption of refrigerators, refrigerators/ freezer combinations, clothes dryers, PCs and other appliances for the year 2015 are estimated by the IEA Secretariat.

Data for energy consumption of clothes dryers are available from 2004 onwards.

Industry and Services sectors

Some discrepancies between the IEA energy efficiency indicators and the IEA energy balances figures might occur. Work is ongoing to improve the consistency of both databases.

Data for energy consumption for rubber and other manufacturing are available from the years 2007 onwards.

Data for heat consumption for casting of iron and steel for 2015 and 2016 are based on IEA estimates.

Transport sector

Data for vehicle-kilometres of passenger cars for several years, and for passenger trains and domestic passenger ships for the year 2016 are estimated by the IEA Secretariat.

Data for vehicle-kilometres of freight road transport are not available for several years.

Data on energy consumption and passenger-kilometres of motorcycles are not available.

Data for energy consumption for freight airplanes and passenger ships are not available, and might be included under passenger airplanes and freight ships, respectively.

Energy consumption data for the transport sector for Czech Republic in the current data cycle are based on the Odyssee database. Revisions are expected to take place in future data cycles.

Denmark

Sources

Danish energy Agency through the Odyssee database.

Years covered

2000-2016.

General note

There may be breaks in some data series due to data revisions.

Residential sector

The data for combustible renewables and waste in space heating includes the heat contribution of heat pumps.

Data for energy consumption of water heating is included under space heating. Lighting energy consumption is included under other appliances.

Data for refrigerators and PCs are not available.

Data for energy consumption of different appliances types have been revised since the last edition of this publication.

Industry and Services sectors

Data for energy consumption of rubber manufacturing [ISIC 22] for the year 2016 are not available at the time of preparing this publication.

Transport sector

Data for passenger-kilometres of motorcycles are not available.

Data for tonne-kilometres of freight road transport include only Danish registered vehicles with a capacity of over 6 tonnes.

Data on loads of freight transport are not available.

Data on energy consumption of passenger ships and freight airplanes are not available, and may be partially included under freight ships and passenger airplanes, respectively.

Finland

Sources

Statistics Finland and Motiva.

Years covered

2000-2016.

General note

Some discrepancies between the IEA energy efficiency indicators and the IEA energy balances may occur. Work is ongoing to improve the consistency between the two datasets.

Residential sector

Data on energy consumption for space heating, and also on the number of dwellings, excludes summer houses.

Data on residential floor areas includes common heated areas of buildings, and excludes summer houses.

Data for energy consumption for space cooling are available from 2015 onwards.

Data for appliances stocks and unit energy consumption for several years are based on IEA Secretariat estimates.

Data for energy consumption by appliance type are estimated by the IEA Secretariat, based on appliances stocks and unit energy consumption data available. Data for PCs are not available.

Data for energy consumption for other appliances includes electric saunas and electric pre-heating of cars.

Industry and Services sectors

Data for energy consumption of rubber manufacturing [ISIC 22] is not available due to confidentiality issues.

Data for energy consumption from heat for several industry subsectors up to 2006 are based on IEA Secretariat estimates.

Data for "Other building energy use in services sector" includes energy consumption for water heating, lighting, appliances, and street lighting.

Transport sector

There is a break in the time series for passenger-kilometre of passenger cars and buses in 2016, due to a change in data collection methodology. This affects energy intensities of these transport modes.

Data for passenger-kilometres of motorcycles, and tonne-kilometres data for freight airplanes are not available.

Vehicle stocks data refer to vehicles registered in the country and not vehicles in circulation.

The energy consumption from diesel and light fuel oil for passenger ships may be reported together with domestic freight ships up to 2009.

Data on energy consumption of freight airplanes are not available and may be partially included under passenger airplanes.

France

Sources

Ministère de la transition écologique et solidaire (SDES – service de la donnée et des études statistiques); Odyssee database.

Years covered

2000-2016.

General note

Energy and activity data include only metropolitan France except for value added for the industry and services subsectors, which includes overseas departments.

Residential sector

Data for energy consumption from natural gas for some end uses has been revised from the year 2011 onwards.

Data for PCs are not available.

Industry and Services sectors

There may be breaks for some industry subsectors for the consumption of electricity and natural gas for the year 2011, due to a new data collection methodology based on an annual industry survey.

Some data for energy consumption from natural gas and renewables for some industry subsectors are based on IEA Secretariat estimates.

The end use split of energy consumption data for the services sector from renewables and waste, heat, and electricity before the year 2014 are based on IEA Secretariat estimates.

Value added data for some industry subsectors for the year 2016 are estimated by the IEA Secretariat.

Transport sector

The energy consumption data of passenger ships is estimated by the IEA Secretariat.

Vehicle stocks data refer to vehicles registered in the country.

Germany

Sources

Federal Ministry for Economic Affairs and Energy, Federal Ministry for Transport and Digital Infrastructure, Federal Statistical Office, Fraunhofer-Gesellschaft.

Years covered

2000-2016.

General note

Some discrepancies between the IEA energy efficiency indicators and the IEA energy balances may occur. Some differences result from different data scope and definitions. Work is ongoing to align these two datasets.

Residential sector

There is a break in the time series for floor area of dwellings, for the year 2010, which may affect residential energy intensities. This may be due to the results of the building and housing census from 2011 onwards.

Data for space cooling are available from 2013 onwards. PCs data are not available.

Data for energy consumption from other appliances for the years 2014 and 2015 are estimated by the IEA Secretariat.

Data for combustible renewables and waste include direct use of geothermal and solar thermal heat.

Industry and Services sectors

Data for the energy consumption of electricity, gas, steam, and water supply (ISIC 35-36) and construction (ISIC 41-43) are not available.

Data for the energy consumption of agriculture are based on a national survey. However, these data are not compatible with the IEA energy balances database.

Value added data for industry subsectors for the year 2016 are based on country estimates.

Greece

Sources

Ministry for Environment and Energy (CRES) through the Odyssee database.

Years covered

2000-2015 (2016 – partially).

General note

Results of the IEA decomposition analysis are not available.

Residential sector

End use data for the year 2016 are not available.

In 2013, taxation on oil products for space heating increased substantially, leading to reduced consumption in the residential sector. According to external sources, the consumption of oil products has been partially replaced by non-commercial solid biofuels not yet reported. This leads to a significant reduction of total space heating consumption in 2013, affecting also the energy intensity of this end use. The space heating intensity shown should, thus, be considered with caution.

Data for the energy consumption for other appliances includes lighting.

Energy consumption and appliance stocks data for PCs are not available.

Energy consumption split by appliance type is not available since the year 2014.

Industry and Services sectors

Data on energy consumption of rubber manufacturing [ISIC 22] is included under manufacturing not elsewhere specified.

Transport sector

Data for the transport sector for the year 2016 are not available.

Data for passenger-kilometre for motorcycles are based on IEA Secretariat estimates.

Data for vehicle-kilometre of buses and freight trucks from 2000 to 2009 are based on IEA Secretariat estimates.

The full amount of energy consumption from water transport is allocated to freight ships.

The full amount of energy consumption from air transport is allocated to passenger airplanes.

Hungary

Sources

Hungarian Energy and Public Utility Regulatory Authority.

Years covered

2000-2016.

General note

Results of the IEA decomposition analysis are not available.

Some breaks in energy consumption data may occur in 2013, resulting from an energy consumption survey

introduced in 2014. For instance, some energy consumption was reallocated between industry and services sectors.

Residential sector

Some data points on energy consumption for space heating for different fuels and different years are based on IEA Secretariat estimates.

Data for occupied dwellings for 2000-2001 are based on IEA Secretariat estimates.

Data for energy consumption disaggregated by end-use for the years 2011 to 2014 are estimated by the IEA Secretariat.

Data for energy consumption for other appliances includes all residential appliances, cooling and lighting. Energy consumption for space cooling is reported separately since the year 2015.

Industry and Services sectors

Data for energy consumption for rubber [ISIC 22] and other manufacturing [ISIC 31-32] are reported separately from 2013 onwards.

Data for combustible renewables and waste consumption in the services sector for 2000 to 2009 are based on IEA Secretariat estimates.

There are some breaks in the time series of value added data.

Transport sector

Data for energy consumption and activity (passenger-kilometres) for passenger cars include motorcycles.

Data for activity (passenger-kilometre) of passenger trains from 2000 to 2006 are based on IEA Secretariat estimations.

Data for activity (tonne-kilometres) of freight transport include both domestic and international transport.

Data for passenger car vehicle-kilometre and occupancy are not available after 2010.

Data for activity of air transport are not available. Energy consumption of passenger airplanes is available from 2000 to 2010.

Data for energy consumption of passenger and freight trains from 2011 to 2014 are based on IEA Secretariat estimates.

Data for energy consumption for freight ships include passenger ships up to 2012.

Ireland

Sources

Sustainable Energy Authority of Ireland.

Years covered

2000-2016.

Residential sector

Data for energy consumption for lighting and residential appliances split by appliance type are not available.

Data for energy consumption from combustible renewables and waste for water heating includes solar thermal.

Data for energy consumption and appliances stocks for PCs are not available.

Industry and Services sectors

Due to confidentiality issues, value added data of some industry subsectors is either not available or reported in an aggregated way:

Value added of [ISIC 17-18] includes also [ISIC 16]. Value added of [ISIC 23] includes also [ISIC 22]. Value added of [ISIC 24] includes also [ISIC 25].

Value added of [ISIC 20-21] includes only [ISIC 21]. Value added of [ISIC 25-28] includes only [ISIC 26-28]. Value added of [ISIC 31-32] includes only [ISIC 33].

Value added of [ISIC 20-21] and [ISIC 31-32] is not available for the years 2015 and 2016.

Value added data for the year 2016 are based on IEA Secretariat estimates.

Transport sector

Discrepancies between the IEA energy efficiency indicators and the IEA energy balances for oil products are due to different reporting sources. Work is ongoing to align the two datasets.

Data on activity of passenger transport (passenger-kilometre) for 2016 are based on IEA Secretariat estimates.

Data for tonne-kilometres of ships are not available after 2008.

Data for energy consumption of freight road transport exclude light duty vehicles.

Data for energy consumption of motorcycles and freight trains are not available.

Data for energy consumption of passenger ships and freight airplanes are not available, and may be partially included under freight ships and passenger airplanes, respectively

Italy

Sources

Ministry of Economic Development, Terna and ENEA; Ricerca Sistema Energetico (RSE).

Years covered

2000-2016.

General note

Results of the IEA decomposition analysis are not available.

Residential sector

The data on split of electricity consumption for residential end uses was significantly revised this cycle, which leads to differences in the energy intensities of the end uses revised (particularly space heating, space cooling and residential appliances).

Industry and Services

Data for energy consumption of some industry subsectors for natural gas and heat for the years 2000-2003 are based on IEA Secretariat estimates.

Data for energy consumption of wood and wood products [ISIC 16] and rubber and plastics [ISIC 22] is included in Manufacturing Not Elsewhere Specified.

Data for energy consumption of metal products and machinery [ISIC 25-28] includes manufacture of motor vehicles [ISIC 29-30].

Data for value added of some industry subsectors for the year 2016 are based on IEA Secretariat estimates.

Japan

Sources

Ministry of Economy Trade and Industry (METI), Agency for Natural Resources and Energy.

Years covered

2000-2016.

General note

There may be some discrepancies between the IEA energy efficiency indicators and the IEA energy balances data. Work is ongoing to improve consistency.

Residential sector

Data for energy consumption from combustible renewables and waste for water heating includes solar thermal.

Data for energy consumption for residential appliances include lighting.

Data for energy consumption of residential appliances disaggregated by appliance type are not available.

Data for stocks of dish washers are available from 2004 onwards.

There is a break in stocks of clothes dryers for the year 2013 as, from this year onwards, it includes bathroom dryers.

Industry and Services

Value added data are based on 2005 instead of 2010, as for the other countries, revisions are expected in the next data cycle. For the year 2016, value added data are based on IEA Secretariat estimates.

Transport sector

Data for passenger-kilometre and vehicle-kilometre of motorcycles are not available.

Data for vehicle-kilometre of freight trains, domestic freight airplanes and domestic freight ships are not available.

Korea

Sources

Korea Energy Economics Institute.

Years covered

2000-2015.

Residential sector

Data for other appliances include electricity consumption for cooking and night-time electricity, which

represents mostly space heating. This may affect cooking end-use indicators.

Data for energy consumption and stocks of clothes dryers are not available.

Industry and Services sectors

Data for energy consumption for some industry subsectors has been revised in this edition of the publication. This may affect energy intensities for the industry subsectors concerned.

Data for energy consumption for rubber [ISIC 22] is included under manufacturing not elsewhere specified.

The shares of value added for the different industry subsectors and energy intensities may differ from last year publication, as the Bank of Korea is the new source of macroeconomic data. The updates in value added data may also present some breaks in time series.

Transport sector

In the current edition of this publication, the energy consumption of domestic passenger and freight airplanes has been revised for the years 2008-2011.

Data for passenger cars include passenger vans (up to 15 passengers).

Luxembourg

Sources

STATEC–NSI Luxembourg.

Years covered

2000-2016.

General note

There may be some discrepancies between the data in this publication and the IEA energy balances.

Results of the IEA decomposition analysis are not available.

Residential sector

Data for energy consumption disaggregated by end-use is available from year 2008 onwards.

Data for energy consumption of residential appliances disaggregated by appliance type are not available.

Data for diffusion and stock of appliances are available only for year 2011.

Industry and Services sectors

Heat consumption in industry is reported from 2003 onwards.

Energy consumption from combustible renewables and waste in the wood manufacturing sub-sector is reported from 2005 onwards.

Due to confidentiality issues, data for energy consumption of chemicals [ISIC 20-21] includes rubber [ISIC 22], whereas value added of rubber [ISIC 22] is included in the manufacture of non-metallic mineral products [ISIC 23]. For this reason the corresponding intensities are not calculated.

Data for value added of basic metals [ISIC 24], machinery [ISIC 25-28], and motor vehicles [ISIC 29-30] are not available. Value added of ISIC [20-21] includes only ISIC 20.

Transport sector

Data for energy consumption of motorcycles, freight airplanes and freight ships are not available.

Data on passenger-kilometres for motorcycles, passenger airplanes and passenger ships are not available.

Data for tonne-kilometres of freight airplanes and freight ships are not available.

Data for vehicle-kilometres and occupancy for passenger cars are available from 2008 onwards.

The full amount of energy consumption in water transport is allocated to passenger ships.

Energy consumption data of passenger cars has been significantly revised in this edition of the publication, with respective total consumption now evidencing higher amounts, and hence affecting total energy consumption of passenger transport.

Mexico

Sources

CONUEE – Comisión Nacional para el Uso Eficiente de la Energía.

Years covered

2000-2016 (partially).

General note

Mexico became the International Energy Agency's 30th member country on 17 February 2018, and is included for the first time in the 2018 edition of this publication.

Work is ongoing to improve data availability in all sectors, and new data are expected to be included in future editions of the publication.

Results of the IEA decomposition analysis are not available.

Residential sector

The data coverage of end use energy consumption of the residential sector in Mexico is limited. Work is ongoing (including a new household survey) to improve the availability of residential end use data. This should be included in future editions of this publication.

Data on floor area of dwellings are not available for the year 2016.

Data on appliances stocks is available only for refrigerators, clothes washers and TVs. It refers to stocks in households, not in dwellings like for other countries.

Industry and Services sectors

Data for electricity consumption for manufacture of non-metallic minerals [ISIC 23] before the year 2003 are based on IEA Secretariat estimates.

The electricity consumption of the services sectors may be partially included in the industry sector due to the current data collection methodology.

Data for electricity consumption under other building energy use in the services sector for the years 2014-2016 are based on IEA Secretariat estimates.

Data on floor area of services are not available.

Transport sector

Energy consumption data split by transport mode / vehicle type is not available. Work is ongoing to publish this split of energy consumption for transports in future editions of this publication.

Energy consumption data for air transport only include aviation gasoline.

Activity data for passenger transport (passenger-kilometre) are only available for domestic passenger airplanes, and domestic passenger ships, the latter from 2010 onwards.

Activity data for freight transport (freight-kilometre) for domestic freight airplanes and domestic freight ships is available from 2010 onwards.

Vehicle-kilometres, passenger occupancy and data on freight loads are not available.

Netherlands

Sources

Energy research Centre of the Netherlands (ECN) through the Odyssee database.

Years covered

2000-2016.

Residential sector

Energy consumption and appliances stocks data for PCs are not available.

Residential floor area for the years 2010 and 2011 is estimated by the IEA Secretariat.

Industry and Services sectors

Data for the split of energy consumption for paper [ISIC 17] and printing [ISIC 18] is available only up to 2009.

Heat consumption for casting of precious and non-ferrous metals [ISIC 2420+2432] up to the year 2005 is estimated by the IEA Secretariat.

Data for energy consumption for rubber [ISIC 22] are included in manufacturing not elsewhere specified.

Data on services floor area are not available.

Transport sector

Data for passenger-kilometres of motorcycles, passenger airplanes and passenger ships are not available.

Data for tonne-kilometres of freight road transport include national transport by Dutch vehicles and the share of international transport by Dutch vehicles taking place within Dutch borders (estimated as 100 km per international trip).

Data for tonne-kilometres for freight ships includes freight traffic only in rivers.

Data for vehicle-kilometres for the year 2016 is estimated by the IEA Secretariat, and data for vehicle-kilometres for motorcycles and buses is available only up to 2007.

Data for energy consumption for domestic passenger ships and domestic freight airplanes are not available. These may be partially included under domestic freight ships and domestic passenger airplanes, respectively.

New Zealand

Sources

Energy efficiency and conservation authority (EECA), and Ministry of Business, Innovation & Employment (MBIE).

General note

Most of the data for 2016 are based on early national estimates. These data may be updated in the next edition of this publication.

Years covered

2000-2016.

Residential sector

Unit energy consumption for dish washers for the year 2016 is an IEA Secretariat estimate.

Industry and Services sectors

Data on energy consumption for the year 2016 for [ISIC 17-18], [ISIC 20-21], [ISIC 22], [ISIC 23], [ISIC 25-28], [ISIC 31-32] and [ISIC 35-36] are based on IEA Secretariat estimates.

Data for value added for chemicals [ISIC 20-21] includes rubber [ISIC 22] and refining and coke processing [ISIC 19].

Data for value added for the different industry subsectors was significantly revised this cycle. This may affect energy intensities accordingly, and possibly lead to some breaks.

Poland

Sources

Central Statistical Office.

Years covered

2000-2016.

Residential sector

Data on energy consumption for water heating and appliances from 2015 onwards.

Data on energy consumption for appliances includes lighting, and data for energy consumption for space cooling is not available.

Data for stocks of PCs and clothes dryers are not available.

Industry and Services sectors

The energy consumption data of the services sector includes water supply and treatment [ISIC 36].

Data on floor areas of the services sector is not available.

Data on value added of the services sector for the years 2000-2002 and 2016 are based on IEA Secretariat estimates.

Transport sector

Data on passenger-kilometres of motorcycles are not available.

Data on loads of freight road transport are not available.

Data on vehicle-kilometres of passenger cars for the year 2016 are not available.

Data for energy consumption of passenger and freight trains, and domestic passenger airplanes for the year 2016 are based on IEA Secretariat estimates.

Data for energy consumption and activity of passenger ships and freight airplanes (passenger-kilometres and tonne-kilometres, respectively) are not available. Data for energy consumption for these two transport segments might be partially included under freight ships and passenger airplanes, respectively.

Portugal

Sources

Direcção Geral de Energia e Geologia, through Odyssee database.

Years covered

2000-2016.

General notes

Some transport energy consumption may be included under industry and services.

Results of the IEA decomposition analysis are not available.

Residential sector

Data for energy consumption of residential appliances disaggregated by appliance type are available from 2010 onwards.

Results from a survey on energy consumption in households led to break in series of combustible renewables and waste in the year 2010.

Energy intensities for cooking are significantly higher than those for other IEA member countries. This may be explained by the fact that several appliances used for cooking purposes were accounted under "cooking" instead of "other appliances". A new survey is expected in the future, which may help adjust this trend.

Data for stocks of PCs are only available for years 2010-2012.

Industry and Services sectors

Data on combustible renewables and waste (solid biofuels) were revised based on an industry survey, resulting in breaks in the energy consumption data for the year 2012 for some subsectors, e.g. for non-metallic minerals.

Data on value added of several manufacturing subsectors for the year 2016 is based on IEA Secretariat estimates.

Data on services floor area are available for years 2005-2011.

Transport sector

This cycle, there were significant revisions both on activity and energy consumption data. This leads to breaks in some data series (e.g. energy consumption of passenger cars for the year 2012), and similarly in the related energy intensities.

Data for passenger-kilometre of passenger cars for the year 2016 is estimated by the IEA Secretariat.

Data for passenger-kilometres of motorcycles and passenger ships are not available.

Data for energy consumption of passenger ships and freight airplanes are not available, and may be partially included under freight ships and passenger airplanes, respectively.

Data for the stocks of freight trucks include commercial road transport, although data for tonne-kilometres of freight trucks may exclude commercial road transport.

Slovak Republic

Sources

Ministry of Economy, through Odyssee database

Years covered

2000-2016.

General note

Results of the IEA decomposition analysis are not available.

Data for the energy consumption of transport are not available for all modes. Data for this sector are partially obtained from the country energy balance. Still, the share of transport energy use may be underestimated due to missing data.

Residential sector

Data on energy consumption for space heating include cooking.

Data on energy consumption for space cooling are not available.

Data on energy consumption for other appliances include dish washers, clothes dryers and PCs.

Data on stocks of dish washers, clothes dryers and PCs are not available.

Industry and Services sectors

Data on energy consumption for rubber [ISIC 22] and other manufacturing [ISIC 31-32] are included under manufacturing not elsewhere specified, while data for value added are reported separately.

Data for services floor area are not available.

Transport sector

Data for passenger-kilometre of passenger cars for the year 2016 are based on IEA Secretariat estimates.

Data for passenger-kilometre of motorcycle and domestic passenger ships, tonne-kilometre of domestic freight airplanes are not available.

Data for vehicle-kilometres of passenger trains are available between 2011-2014.

Data on loads of freight transport are not available.

The disaggregation of energy consumption in transport is not available for some modes/vehicle types (e.g. freight road transport).

Data on energy consumption of domestic freight ships from 2006 onwards.

Energy consumption for domestic passenger airplanes is not available for the years 2015 and 2016.

Data for energy consumption of domestic passenger ships, and domestic freight airplanes are not available. These may be partially included under freight ships and passenger airplanes, respectively.

Spain

Sources

Instituto para la Diversificación y Ahorro de la Energía (IDAE); Odyssee database.

Years covered

2000-2016.

General note

Results of the IEA decomposition analysis are not available.

Residential sector

There may be some breaks between 2009 and 2010 for electricity consumption of different end uses, due to different data collection methodologies.

Data for energy consumption of residential appliances by appliance type are not available.

Data for stocks of residential appliances are available only up to 2010.

Industry and Services sectors

Data for energy consumption for rubber [ISIC 22] and other manufacturing are included under non-specified manufacturing, while data for value added are available separately.

Data for value added for 2016 are based on IEA Secretariat estimates.

Transport sector

Passenger-kilometre data for passenger trains has been significantly revised in this edition of the publication, now showing lower values for the whole time series. Accordingly, intensities may be affected upwards.

Energy consumption data for domestic passenger airplanes and domestic freight ships for the year 2016 are based on IEA Secretariat estimates.

Energy consumption data for domestic freight airplanes and domestic passenger ships may be partially included in domestic passenger airplanes and domestic freight ships, respectively.

Sweden

Sources

Swedish Energy Agency; Odyssee database.

General notes

Results of the IEA decomposition analysis are not available.

Years covered

2000-2016 (partially).

General note

There may be some discrepancies between the IEA energy efficiency indicators and the IEA energy balances data. Work is ongoing to improve consistency between these two databases.

The results of the decomposition analysis are not available in this edition of the publication.

Residential sector

Data for energy consumption for space cooling are not available.

Data for energy consumption for lighting and for appliances by appliance type is available only until 2013

Data for total energy consumption of residential appliances include lighting for the years 2014-2016, and data for other appliances include clothes dryers, TVs and PCs.

Data for stocks and diffusion of appliances is only available up to 2013.

Industry and Services sectors

Data for combustible renewables and waste for agriculture [ISIC 01-03] and for the production of paper [ISIC 17] are based on IEA Secretariat estimates up to 2013 and for the whole time series, respectively.

Data for value added for the year 2016 for several manufacturing sub-sectors are based on IEA Secretariat estimates.

Transport sector

Data for energy consumption of both passenger and freight road transport (passenger cars, motorcycles, buses, and trucks) are not available for 2015 and 2016. Energy consumption data for domestic freight airplanes is not available for the whole time series.

Switzerland

Sources

Swiss Federal Office of Energy (SFOE).

Years covered

2000-2016.

General notes

Results of the IEA decomposition analysis are not available.

Residential sector

Data on energy consumption for space cooling are not available.

Data on energy consumption for refrigerator/freezer combinations have been significantly revised in the latest edition of this publication, in order to now split consumption between refrigerators and refrigerator/freezer combinations, which had been reported together before.

Industry and Services sectors

Data for several industry subsectors has been revised, and consistency with the IEA energy balances is improved. This may lead to differences in the respective energy intensities, comparing to previous editions of this publication.

Data on energy consumption for wood manufacturing [ISIC 16] are not available, while data for value added are.

Data for energy consumption for machinery [ISIC 25-28] may also include transport equipment [ISIC 29-30], while value added data are available separately. The intensity figures are calculated aggregating value added data for these two subsectors.

Transport sector

Discrepancies in energy consumption data for transport in relation to the IEA energy balances are mostly due to different accounting methodologies (e.g. fuel tourism is excluded in this publication, etc.).

Activity data (passenger and tonne-kilometres) for domestic airplanes and ships are not available.

Turkey

Sources

General Directorate of Energy Affairs (GDEA).

Years covered

2000-2016.

Residential sector

Data for energy consumption for space cooling and for appliances, split by appliance type, are not available.

Data for appliances for the year 2016 is based on IEA Secretariat estimates.

Data for appliances stocks for clothes dryers, TVs, PCs are not available.

Industry and Services sectors

Data for energy consumption for manufacturing of rubber and plastic products [ISIC 22] is available only for 2016.

Data on value added is available only at the level of ISIC section (Rev. 4). Further data availability for the different manufacturing subsectors is expected in the future.

Data for services floor area are not available.

Transport sector

Data for passenger-kilometre of passenger cars, motorcycles, buses and passenger airplanes are not

available. Data for domestic passenger ships is available form 2003 onwards.

Data for tonne-kilometre for domestic freight airplanes, and ships are not available.

Data for freight loads of freight road transport are not available.

Energy consumption data split by transport mode/ vehicle type are not available. Work is ongoing in order to improve data availability by mode/ vehicle type for the transport sector.

United Kingdom

Sources

Department for Business, Energy and Industrial Strategy (BEIS); Odyssee database.

Years covered

2000-2016.

General note

There may be some discrepancies between the IEA energy efficiency indicators and the IEA energy balances data. Work is ongoing to improve consistency between these two databases.

The results of the decomposition analysis for the year 2016 are not available.

Residential sector

There were some revisions on the energy consumption data of several residential end uses from 2011 onwards, due to the new Building Energy Efficiency Survey (BEES) survey.

Data for energy consumption for other residential appliances may include space cooling.

Data for occupied dwelling for the year 2004 are based on IEA Secretariat estimates.

Industry and Services sectors

The shares value added for the different industry subsectors and respective energy intensities may differ from last year publication, as the source of macroeconomic data is now the Office for National Statistics. This change may also lead to breaks in the energy intensities of different industry subsectors.

There are some breaks for energy consumption data of the services sector for the year 2015, due to the new BEES survey.

Transport sector

Freight road transport activity data (tonne-kilometre) are not available for the year 2016.

Data for diesel consumption of passenger cars, and gasoline consumption of freight road transport for the year 2016 are based on IEA Secretariat estimates.

Energy consumption data for road transport (passenger and freight) has been significantly revised comparing to the previous edition of this publication, which may lead to some breaks in the time series.

The energy consumption reported under domestic freight ships also includes domestic passenger ships. For this reason, energy intensities of this transport mode should be carefully considered.

United States

Sources

United States Energy Information Administration (EIA); for transport activity data: U.S. Department of Transportation (DOT).

Years covered

2000-2016.

General note

There may be some discrepancies between the IEA energy efficiency indicators and the IEA energy balances data. Work is ongoing to improve consistency between these two databases.

Data can show some breaks for 2012 due to a new methodology used in the Annual Energy Outlook 2015 reference case (EIA).

Residential sector

Data reported under "other" fuels for clothes dryers refers to energy consumption from natural gas.

Data on appliances stocks for freezers, refrigerators/ freezer combinations and clothes dryers for the years 2012-2014 are based on estimates by the IEA Secretariat. Data for appliances stocks for the year 2016 for

dish washers, clothes washers, TVs and PCs are based on IEA Secretariat estimates.

Industry and Services sectors

Data for energy consumption of some manufacturing subsectors, for some fuels, prior to the year 2012 are based on IEA Secretariat estimates.

There are some breaks on services sector (e.g. lighting) for the year 2015. This is partially due to methodological changes (the incorporation of data from the 2012 Commercial Buildings Energy Consumption Survey in the new report), and partially reflecting real trends.

Data for value added of manufacture of chemicals and chemical products [ISIC 20-21] for the years 2014-2016 are based on IEA Secretariat estimates.

Data for floor area of services are not available for the years 2001-2007, and year 2009.

Transport sector

Data for energy consumption from LPG for passenger cars has been revised for more recent years due to updates on vehicle stocks data. These data prior to 2014 are based on IEA Secretariat estimates.

Data for energy consumption of domestic passenger airplanes up to 2015 is based on IEA Secretariat estimates.

BEYOND IEA MEMBER COUNTRIES

GENERAL NOTES

The notes given in this section refer to data for the years 2000 to 2016 published in this book, as well as on the online data service, for countries beyond IEA, which have voluntarily partnered with the IEA on the development of energy efficiency indicators.

Morocco is included for the first time in this edition of the publication as the first IEA association country providing relevant information.

Armenia, Belarus, Republic of Moldova and Ukraine are included for the first time in this edition of the publication, thanks to the ongoing collaboration with the IEA under the EU4Energy programme, which develops energy statistics capacity in Eastern Europe, Caucasus and Central Asia.

The IEA welcomes this voluntary effort from countries beyond members with a view to strengthen global end use data availability.

For the countries referred to above, data availability may differ from that of IEA member countries and is expected to expand over time.

Data are obtained from national administrations through direct submission of the energy efficiency indicators questionnaire, as indicated for each country under the sources section.

In case of estimates made by the IEA Secretariat, explanations of the estimates are provided in the respective country notes.

Morocco

Sources

Ministère de l'Energie, des Mines et du Développement Durable.

Years covered

2000-2016 (partially).

General note

There are some discrepancies between the IEA energy efficiency indicators and the IEA energy balances databases. Work is ongoing to improve data consistency.

Results of the IEA decomposition analysis are not available.

Residential sector

Data for energy consumption split by end use are available from the year 2004 onwards.

Data for energy consumption per appliance type are available for refrigerators, clothes washers and TVs.

Data for appliances stocks and diffusion are not available. Instead, the publication shows the change in the rate of dwellings equipped with specific appliances types for the time period 2004-2015.

Data available on dwellings refers to total dwellings instead of occupied dwellings.

Data for residential floor area are available only for the year 2012.

Data for heating and cooling degree days are not available.

Industry and Services sectors

Data for energy consumption for manufacture of rubber and plastic products [ISIC 22] are included under Manufacturing not elsewhere specified.

Data for value added are available from the year 2007 onwards. Data for value added are not available for several manufacturing subsectors.

Non-Building Energy use in the service sector refers to street lighting.

Transport sector

Data for passenger-kilometres and tonne-kilometres are available for rail only from the year 2004 until 2015. These have been estimated by the IEA Secretariat based on country submission.

Data for occupancy and loads of road transport are not available.

Data for vehicle stocks and vehicle-kilometres are based on country estimates, and are available from 2008 onwards.

Data for vehicle stocks of passenger cars may include buses.

Data for energy consumption of passenger cars and freight road transport are based on country estimates, and are available from 2008 onwards. Data for energy consumption of passenger cars also include motorcycles and buses.

Data for energy consumption of domestic passenger airplanes may also include domestic freight airplanes.

Data for energy consumption of rail transport split between passenger and freight rail are not available. Data for energy consumption of domestic water transport are also not available.

Armenia

Sources

Statistical Committee of the Republic of Armenia, Yerevan.

Years covered

2000-2016 (partially).

General note

End use data are not available for the residential and transport sectors.

Results of the IEA decomposition analysis are not available.

Industry and services sectors

Data split by industry subsector for oil products, natural gas and combustible renewables and waste consumption in the industry sector are reported from the year 2014 onwards. This leads to breaks in the time series for total final energy consumption of several industry subsectors.

Data for coal and heat consumption in the industry sector are not available.

Partial energy consumption data availability may lead to relatively low energy intensities. Work is ongoing to improve data availability across industry subsectors.

Data for value added are available from 2012 onwards. The conversion of these data into 2010 USD PPP is made by IEA Secretariat, based on country submission.

The data for value added of the services sector are from the World Bank indicators.

Belarus

Sources

National Statistical Committee of the Republic of Belarus.

Years covered

2000-2016 (partially).

General note

Data split by mode/ vehicle type for the transport sector are not available.

Results of the IEA decomposition analysis are not available.

Residential sector

Energy consumption data disaggregated by end use are available from 2014 onwards.

Energy consumption data for cooling and split by appliance type are not available. Energy consumption for lighting is reported together with other appliances.

Appliances stocks data are not available.

Data on dwellings, residential floor area, household occupancy and degree days are available form 2014 onwards.

Industry and Services sectors

Data for energy consumption for paper and printing [ISIC 17-18] are allocated in full to paper production [ISIC 17].

Data for energy consumption for manufacturing of rubber and plastic products [ISIC 22] are included in the manufacturing of other non-metallic products [ISIC 23].

Data for value added are available from the year 2014 onwards.

Data for value added for Belarus refers to 2014 USD 2014 PPP. It was adjusted for PPP by the IEA Secretariat.

Data for value added for the year 2016 were provided in terms of a new currency denomination. This was adjusted to the previous denomination (using PPP) in order to make it comparable with the previous time series.

Republic of Moldova

Sources

National Bureau of Statistics of the Republic of Moldova.

Years covered

2000–2016 (partially).

General note

The data presented does not include the districts from the left side of the river Nistru and municipality Bender.

Data split by mode/ vehicle type for the transport sector are not available.

Results of the IEA decomposition analysis are not available.

Residential sector

Data for energy consumption from renewables shows a break for the year 2010, which is also affecting the time series for total energy consumption of this sector. This may be due to different data collection methodologies, and work is ongoing to improve consistency of the time series.

Energy consumption data split by end use are available from the year 2015 onwards.

Data for energy consumption of appliances are included under lighting. Data for appliances stocks are available from the year 2010 onwards.

Data for occupied dwellings are not available. Hence, energy intensities per dwelling are calculated using total number of dwellings instead of occupied dwellings. Similarly, appliances diffusion refers to total number of dwellings.

Data for heating and cooling degree days are not available.

Industry and Services sectors

Data for energy consumption from renewables are available from 2005 onwards.

Data for energy consumption for manufacturing of rubber and plastic products [ISIC 22] and for electricity, gas, steam, air conditioning and water supply [ISIC 35-36] are available from 2012 onwards.

Data for value added are available from 2015 onwards, and refers to 2015 USD PPP. The adjustment of these data for PPP is made by IEA Secretariat, based on country submission.

Data for value added of the services sector are not available.

Ukraine

Sources

State Statistics Service of Ukraine.

Years covered

2000-2016 (partially).

General notes

From 2013, data coverage are likely to exclude the Donetsk and Luhansk regions of Ukraine and the Autonomous Republic of Crimea, due to limited

information being available to the State Statistics Service of Ukraine from these areas.

End use data are not available for the residential and transport sectors.

Results of the IEA decomposition analysis are not available.

Industry and Services sectors

Data for energy consumption for manufacturing of rubber and plastic products [ISIC 22] are included under Manufacturing not elsewhere specified.

Data for energy consumption for electricity, gas, steam, air conditioning and water supply [ISIC 35-36] are available from 2014 onwards.

Data for value added are only available for the main ISIC categories (e.g. agriculture, manufacturing…), since the year 2014 onwards.

The adjustment of these data for PPP is made by IEA Secretariat, based on country submission.

Data for value added of services are taken from the World Bank indicators.

Energy Data Officer/Statistician

Possible staff vacancies

International Energy Agency, Paris, France

The IEA

The International Energy Agency, based in Paris, acts as energy policy advisor to 30 member countries in their effort to ensure reliable, affordable and clean energy for their citizens. Founded during the oil crisis of 1973-74, the initial role of the IEA was to co-ordinate measures in times of oil supply emergencies. As energy markets have changed, so has the IEA. Its mandate has broadened to incorporate the "Three E's" of balanced energy policy making: energy security, economic development and environmental protection. Current work focuses on climate change policies, market reform, energy technology collaboration and outreach to the rest of the world, especially major consumers and producers of energy like China, India, Russia and the OPEC countries.

The Energy Data Centre, with a staff of around 30 people, provides a dynamic environment for young people just finishing their studies or with one to two years of work experience.

Job description

The data officers/statisticians compile, verify and disseminate information on all aspects of energy including production, transformation and consumption of all fuels, energy efficiency indicators, CO_2 emissions, and energy prices and taxes. The data officers are responsible for the production of data sets through receiving, reviewing and inputting data submissions from member countries and other sources. They check for completeness, correct calculations, internal consistency, accuracy and consistency with definitions. Often this entails proactively investigating and helping to resolve anomalies in collaboration with national administrations. The data officers/statisticians also design and implement computer macros used in the preparation of their energy statistics publication(s) alongside analysis of the data.

Principal qualifications

- University degree in a topic relevant to energy, or statistics. We currently have staff with degrees in mathematics, statistics, information technology, economics, engineering, physics, environmental studies, etc.
- Experience in the basic use of databases and computer software. Experience in Visual Basic is an advantage.
- Ability to work accurately, pay attention to detail and work to deadlines; ability to deal simultaneously with a wide variety of tasks and to organise work efficiently.
- Good communication skills; ability to work well in a team and in a multicultural environment, particularly in liaising with contacts in national administrations and industry; ability to understand, and communicate data.
- An excellent written and oral command of English; knowledge of other languages would be an asset.
- Some knowledge of energy industry operations and terminology would also be an advantage, but is not required.

Nationals of any IEA member country are eligible for appointment. Basic salaries start at 3 300 euros per month. The possibilities for advancement are good for candidates with appropriate qualifications and experience. Tentative enquiries about future vacancies are welcomed from men and women with relevant qualifications and experience. Applications in English, accompanied by a curriculum vitae, should be sent to:

Office of Management and Administration
International Energy Agency
31-35 rue de la Fédération
75739 Paris Cedex 15, France

Online data services

Users can instantly access not only all the data published in this book, but also all the time series used for preparing this publication and all the other statistics publications of the IEA. The data are available online, either through annual subscription or pay-per-view access. More information on this service can be found on our website at *http://data.iea.org*.

Nine annual publications

■ World Energy Statistics 2018

World Energy Statistics provides comprehensive world energy statistics on all energy sources – coal, gas, oil, electricity, renewables and waste. It covers energy supply and consumption for 150 countries and regions, including all OECD countries, over 100 other key energy producing and consuming countries, as well as world totals and various regional aggregates. The book includes detailed tables by country in original units, and summary time series on production, trade, and final consumption by sector.

Published August 2018 - Price: Print €120; PDF €96

■ World Energy Balances 2018

World Energy Balances provides comprehensive energy balances for all the world's largest energy producing and consuming countries. It contains detailed data on the supply and consumption of energy for 150 countries and regions, including all OECD countries, over 100 other key energy producing and consuming countries, as well as world totals and various regional aggregates. The book includes graphs and detailed data by country for all energy sources – coal, gas, oil, electricity, renewables and waste - expressed in balance format. Alongside this, there are summary time series on production, trade, final consumption by sector, as well as key energy and economic indicators and an overview of trends in global energy production and use.

Published August 2018 - Price: Print €120; PDF €96

■ Coal Information 2018

Coal Information provides a comprehensive review of historical and current market trends in the world coal sector. It provides an overview of world coal developments covering coal production and coal reserves, coal demand by type, coal trade and coal prices. A detailed and comprehensive statistical picture of historical and current coal developments in the 35 OECD member countries, by region and individually is presented in tables and charts. Complete coal balances and coal trade data for selected years are presented on 22 major non-OECD coal-producing and -consuming countries, with summary statistics on coal supply and end-use statistics for about 40 countries and regions worldwide.

Published August 2018 - Price: Print €165; PDF €132

Electricity Information 2018

Electricity Information provides a comprehensive review of historical and current market trends in the OECD electricity sector. It provides an overview of the world electricity developments covering world electricity and heat production, input fuel mix, supply and consumption, and electricity imports and exports. More detail is provided for the 35 OECD countries with information covering production, installed capacity, input energy mix to electricity and heat production, consumption, electricity trades, input fuel prices and end-user electricity prices. It provides comprehensive statistical details on overall energy consumption, economic indicators, electricity and heat production by energy form and plant type, electricity imports and exports, sectoral energy and electricity consumption, as well as prices for electricity and electricity input fuels for each country and regional aggregate.

Published August 2018 - Price: Print €150; PDF €120

Natural Gas Information 2018

Natural Gas Information is a detailed reference work on gas supply and demand covering OECD countries and the rest of the world. The publication contains essential information on LNG and pipeline trade, gas reserves, storage capacity and prices. The main part of the book concentrates on OECD countries, showing a detailed supply and demand balance for each country and for the three OECD regions: Americas, Asia-Oceania and Europe, as well as a breakdown of gas consumption by end user. Import and export data are reported by source and destination.

Published August 2018 - Price: Print €165; PDF €132

Oil Information 2018

Oil Information is a comprehensive reference book on current developments in oil supply and demand. This publication contains key data on world production, trade, prices and consumption of major oil product groups, with time series back to the early 1970s. Its core consists of a detailed and comprehensive picture of oil supply, demand, trade, production and consumption by end-user for each OECD country individually and for the OECD regions. Trade data are reported extensively by origin and destination.

Published August 2018 - Price: Print €165; PDF €132

Renewables Information 2018

Renewables Information provides a comprehensive review of historical and current market trends in OECD countries. It provides an overview of the development of renewables and waste in the world since 1990. A greater focus is given to the OECD countries with a review of electricity generation and capacity from renewable and waste energy sources, including detailed tables. However, an overview of developments in the world and OECD renewable and waste market is also presented. The publication encompasses energy indicators, generating capacity, electricity and heat production from renewable and waste sources, as well as production and consumption of renewables and waste.

Published August 2018 - Price: Print €110; PDF €88

CO_2 Emissions from Fuel Combustion 2018

CO_2 Emissions from Fuel Combustion provides a full analysis of emissions stemming from energy use. The data in this book cover the emissions of CO_2 for 150 countries and regions by sector and by fuel. The publication contains estimates of CO_2 emissions, selected indicators such as CO_2/GDP, CO_2/capita and CO_2/TPES and a decomposition of CO_2 emissions into driving factors for more than 150 countries and regions. Emissions are calculated using IEA energy databases and the default methods and emission factors from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

Published November 2018 - Price: Print €165; PDF €132

Energy Efficiency Indicators Highlights 2018

Energy Efficiency Indicators Highlights is designed to help understand what drives final energy use in IEA member countries in order to improve and track national energy efficiency policies. It provides the first comprehensive selection of data that the IEA has been collecting each year after its member states recognised in 2009 the need to better monitor energy efficiency policies. The report includes country-specific analysis of end uses across the largest sectors – residential, services, industry and transport. It answers questions such as:

- What are the largest drivers for energy use trends in each country?
- Was energy saved because of efficiency progress over time?
- How much energy is used for space heating, appliances or cooking?
- What are the most energy-intensive industries?

Improving energy efficiency is a critical step for governments to take to move towards a sustainable energy system. This report highlights the key role of end-use energy data and indicators in monitoring progress in energy efficiency around the world.

Published December 2018 - Free pdf

Two quarterlies

Oil, Gas, Coal and Electricity

Oil, Gas, Coal and Electricity provides detailed and up-to-date quarterly statistics on oil, natural gas, coal and electricity for the OECD countries. Oil statistics cover production, trade, refinery intake and output, stock changes and consumption for crude oil, NGL and nine selected product groups. Statistics for electricity, natural gas and coal show supply and trade. Oil and coal import and export data are reported by origin and destination. Gas imports and exports data are reported by entries and exits of physical flows. Moreover, oil and coal production are reported on a worldwide basis.

Published Quarterly - Price €120, annual subscription: Print €380; PDF €304

Energy Prices and Taxes

Energy Prices and Taxes provides up-to-date information on prices and taxes in national and international energy markets. It contains crude oil import prices by crude stream, industry prices and consumer prices. The end-user prices for OECD member countries cover main oil products, gas, coal and electricity. Every issue includes full notes on sources and methods and a description of price and tax components in each country.

Published Quarterly - Price €120, annual subscription: Print €380; PDF €304

Electronic editions

To complement its publications, the Energy Data Centre produces online data services containing the complete databases which are used for preparing the statistics publications. Built-in software allows you to access and manipulate all these data in a very user-friendly manner and includes graphic facilities.

Annual Databases

- World Energy Statistics 2018 — Price: €800 (single user)
- World Energy Balances 2018 — Price: €800 (single user)
- **World Energy Statistics and Balances 2018** — Price: €1 400 (single user)
  (Combined subscription of the above two series)
- Coal Information 2018 — Price: €550 (single user)
- Electricity Information 2018 — Price: €550 (single user)
- Natural Gas Information 2018 — Price: €550 (single user)
- Oil Information 2018 — Price: €550 (single user)
- Renewables Information 2018 — Price: €400 (single user)
- CO_2 Emissions from Fuel Combustion 2018 — Price: €400 (single user)
- Energy Efficiency Indicators 2018 — Price: €400 (single user)

Quarterly Databases

- Energy Prices and Taxes — Price: (four quarters) €900 (single user)

Other services

Emissions Factors 2018

The *Emissions Factors* database includes a series of indicators related to emissions from electricity and heat generation for over 150 countries and regions, based on the IEA *World Energy Balances* and *CO_2 Emissions from Fuel Combustion* data. The main factors included are: CO_2, CH_4 and N_2O emissions per kWh of electricity and heat; adjustments due trade (for OECD) and to losses; emission factors by fuel for sectors other than electricity. The database is available in Excel format.

Price: €550 (single user)

World Energy Prices 2018

The *World Energy Prices* data service contains annual end-use energy prices for selected products and sectors for over one hundred countries in the world. Complementing the quarterly OECD *Energy Prices and Taxes*, the world database focuses on prices for gasoline and diesel for transport; as well as electricity for households and industry.

Price: €400 (single user)

Energy Prices & Taxes and World Energy Prices package

This service is a package containing both the *Energy Prices and Taxes* and *World Energy Prices* online data services offered at a reduced rate.

Price: €1 100 (single user)

Detailed descriptions of all these data services are available on our website at ***http://data.iea.org***.

The Monthly Oil Data Service

The *Monthly Oil Data Service* provides the detailed databases of historical and projected information which is used in preparing the IEA's monthly *Oil Market Report* (OMR). The *Monthly Oil Data Service* is available as an annual subscription and includes twelve monthly updates. The service comprises three packages available separately or combined. The data are released on the same day as the official release of the *Oil Market Report.*

The packages include:

- Supply, Demand, Balances and Stocks — Price: €6 150 (single user)
- Trade — Price: €2 050 (single user)
- Field-by-Field Supply — Price: €3 080 (single user)
- **Complete Service** — **Price: €9 200 (single user)**

A description of this service is available on our website at ***www.iea.org/statistics/mods***.

The Monthly Gas Data Service

The *Monthly Gas Data Service* provides the following monthly natural gas data for OECD countries:

- Supply balances in terajoules and cubic metres;
- Production, trade, stock changes and levels where available, gross inland deliveries, own use and losses;
- Highly detailed trade data with about 50 import origins and export destinations;
- LNG trade detail available from January 2002,
- From 2011 onwards, transit volumes are included and trade data corresponds to entries/exits.

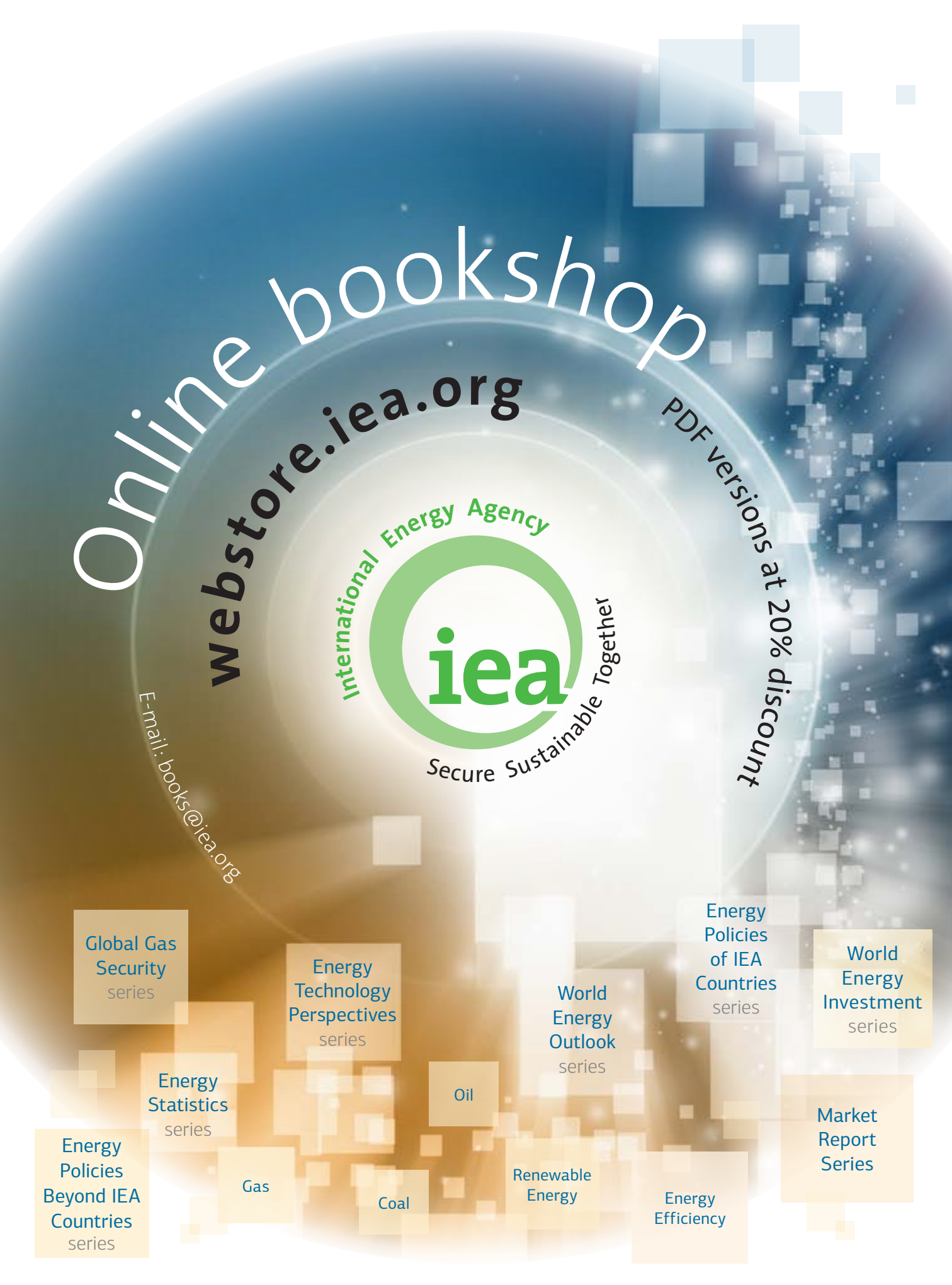
The databases cover the time period January 1984 to current month with a time lag of two months for the most recent data.

Price: €800 (single user)

For more information consult ***www.iea.org/statistics/mgds***.

Moreover, the IEA statistics website contains a wealth of free statistics covering oil, natural gas, coal, electricity, renewables, energy-related CO_2 emissions and more for 150 countries and regions and historic data for the last 20 years. It also contains Sankey flows to enable users to explore visually how a country's energy balance shifts over up to 40 years, starting with production and continuing through transformation to see important changes in supply mix or share of consumption. The IEA Energy Atlas offers panoramas on every aspect of energy on a global basis and for 150 individual countries, with interactive maps and customisable charts that detail and compare a host of data based on the Agency's authoritative statistics. The website also includes free headline energy data in excel format for all OECD countries and global regions from 1971 onwards as well as for Association countries from 1990 onwards.

The IEA statistics website can be accessed at *www.iea.org/statistics/*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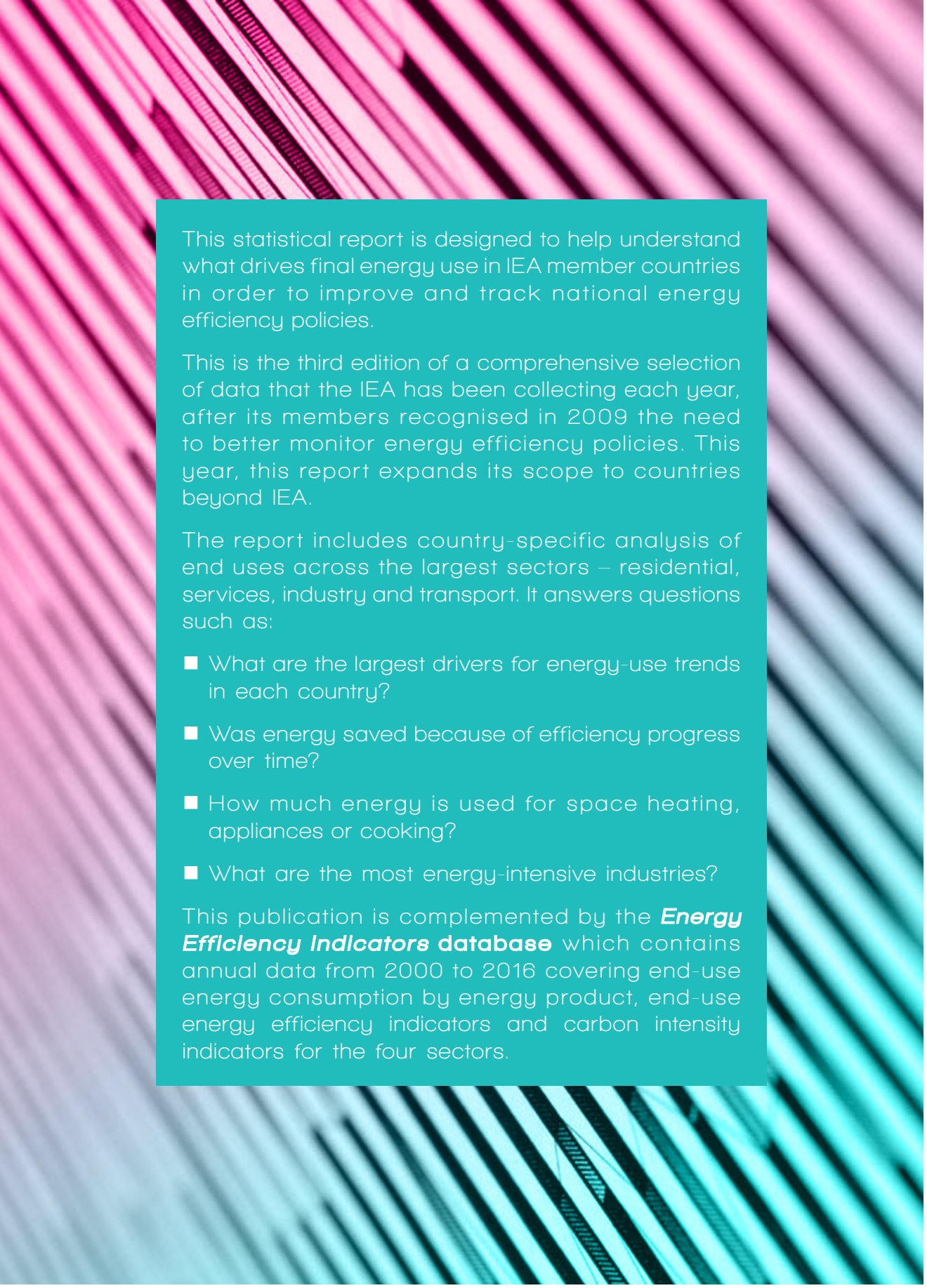

This statistical report is designed to help understand what drives final energy use in IEA member countries in order to improve and track national energy efficiency policies.

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The report includes country-specific analysis of end uses across the largest sectors – residential, services, industry and transport. It answers questions such as:

- What are the largest drivers for energy-use trends in each country?
- Was energy saved because of efficiency progress over time?
- How much energy is used for space heating, appliances or cooking?
- What are the most energy-intensive industries?

This publication is complemented by the ***Energy Efficiency Indicators*** **database** which contains annual data from 2000 to 2016 covering end-use energy consumption by energy product, end-use energy efficiency indicators and carbon intensity indicators for the four sectors.

statistics

2018