Instituto Nacional de Estadística

Press Release

27 November 2017

Environmental accounts
Physical Energy Flow Accounts
Accounting series 2014-2015

The consumption of energy products by households as final consumers increased 4.3% in 2015

The total supply of energy products grew 2.9% as compared to 2014 and domestic production increased 3.7%

Within the framework of the Regulation of the European Union regarding environmental accounts, the National Statistics Institute (INE) published today, for the first time, the physical energy flow accounts. The information presented refers to the years 2014 and 2015.

The physical energy flow accounts registered the physical flows of energy in terajoules (10^{12}joules), from the environment to the economy, within the economy and from the economy to the environment. It shows the origin and destination of energy based on three physical flow categories: natural energy resources, energy products and energy waste. Economic activities include production, consumption and accumulation.

The accounts are consistent with the European System of Accounts (ESA), and it is based on the principle of residence. In line with this principle, the accounts register the data regarding energy in relation to the production and consumption of the resident units in the economic territory.

The processing of the accounts supports the law of conservation of energy, which establishes that energy can be neither created nor destroyed, only transformed. In turn, as in other physical environmental accounts, the environment is incorporated as another sector, given that it is the origin of the natural energy resource flows and the destination of waste energy.

The physical energy flow accounts show how the environment contributes to the economy through the extraction of raw materials to produce energy, with the effects that the economy can have on the environment due to the production and consumption of energy products, thus complementing the information offered by the traditional economic accounts systems.

The origin of physical energy flows

The origin of physical energy flows in the environment (natural energy resources), in the production and the import (energy products) and in the consumption and accumulation (energy waste).

In 2015, the total energy flows amounted to 18,937.8 thousands of terajoules (TJ), representing an increase of 2.9% as compared with the previous year.

In regards to origin, natural energy resources extracted from the environment reached 1,365.8 thousands of TJ, 4.7% less than in 2014.

In turn, the energy product supply amounted to 12,517.4 thousands of TJ, 2.9% more than the previous year (7288.8 thousands of TJ of this figure corresponded to domestic production and 5,288.7 thousands of TJ to imports).

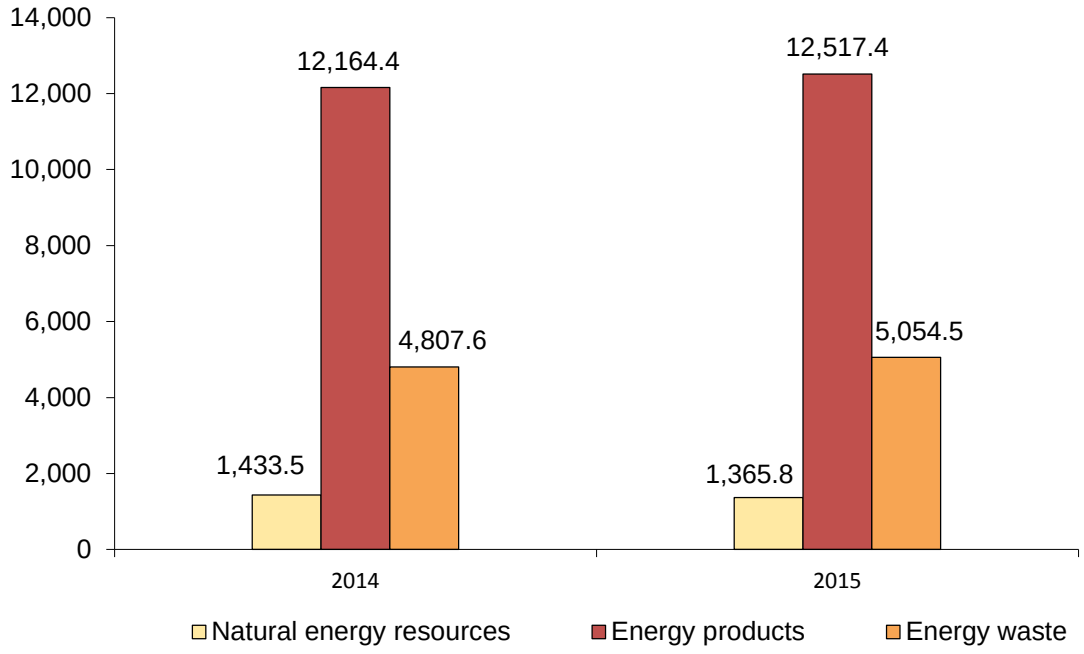
Finally, energy waste increased 5.1%, to 5,054.5 thousands of TJ.

Physical Energy Flows Year 2015

Unit: thousands of TJ

	Total	%	Interannual variations %
Natural energy resources	1,365.8	7.2	-4.7
Energy products	12,517.4	66.1	2.9
Energy waste	5,054.5	26.7	5.1
Total	**18,937.8**	**100.0**	**2.9**

Energy total by physical flow type. Year 2014 and 2015
Unit: thousands of TJ



Domestic production of energy products (7,228.8 thousands of TJ), represented 57.7% of the total supply of this physical flow type, 3.7% more than in 2014. In turn, imports (5,288.7 thousands of TJ) accounted for 42.3%, representing an increase of 1.9% as compared to the previous year.

By energy product type, the greatest production corresponded to Coke and refined petroleum products (56.1% of the total), followed by the Extractive industry products (23.7%), Electricity and heat (15,7%) and Biofuels (4.5%).

The energy products with the greatest weight in imports were Extractive industry products (82.6% of the total) and Coke and refined petroleum products (16.0%).

In turn, the imports with the lowest weight were Electricity and heat (1.0%) and Biofuels (0.4%).

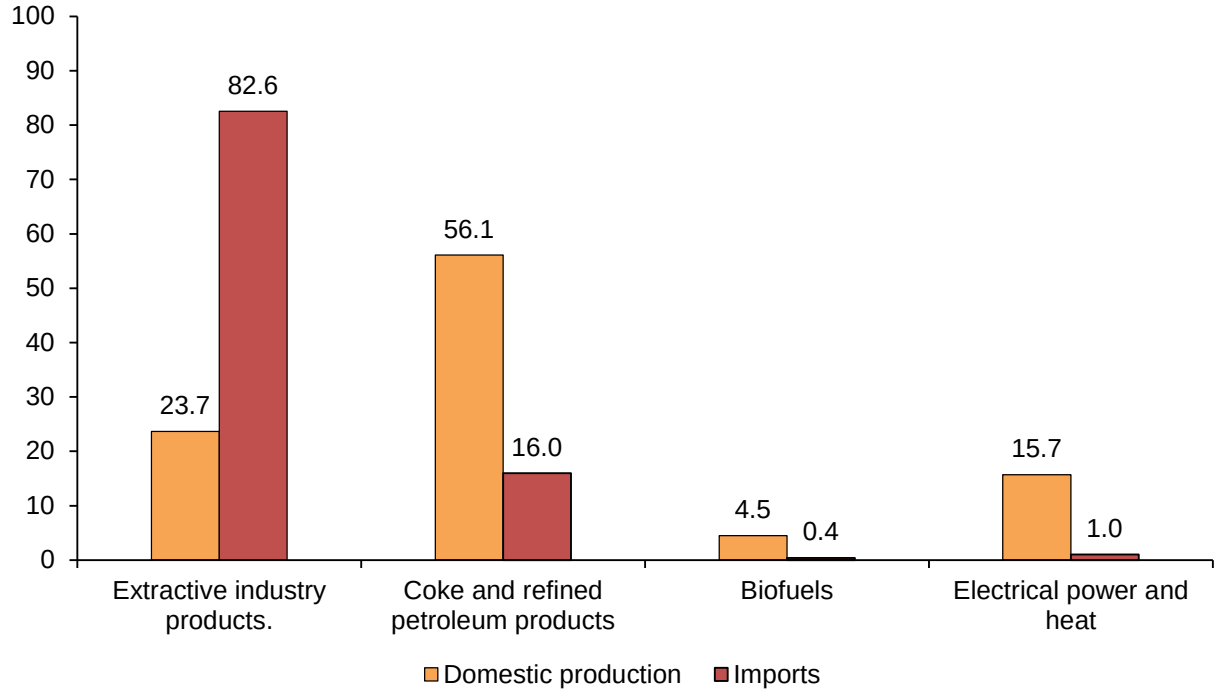
Energy products by type and origin. Year 2015

Unit: thousands of terajoules

	Domestic production	%	Interannual variations %	Imports	%	Interannual variations %
Energy products	**7,228.8**	**100.0**	**3.7**	**5,288.7**	**100.0**	**1.9**
Extractive industry products.[1]	1,710.8	23.7	1.1	4,366.7	82.6	3.8
Coke and refined petroleum products	4,056.9	56.1	6.0	846.2	16.0	-4.7
Biofuels	324.9	4.5	-0.7	21.9	0.4	-59.9
Electrical power and heat	1,136.2	15.7	1.0	53.8	1.0	21.5

1. Coal, crude oil, natural gas, nuclear fuel, etc.

Percentage distribution of the origin of energy products. Year 2015



The destination of physical energy flows

The branches of activity of the economy used 57.6% of the total physical energy flows in 2015, representing an increase of 4.2% as compared to the previous year. 12.5% of this total intermediate energy consumption (10,903.4 thousands of TJ), was Natural energy resources, 86.9% was Energy products and 0.5% was Energy waste.

In turn, households as final consumers of energy products consumed 1,324.7 thousands of TJ, (7.0% of the total), representing an increase of 4.3%.

Exports, which accounted for 9.1% of the total, decreased by 5.0%, to 1,714.8 thousands of TJ.

Finally, 4,920.0 thousands of TJ were emitted to the environment by way of energy losses, due to the different productive processes and the final consumption activities, which represented 26.0% of the total and an increase of 4.0% as compared to 2014.

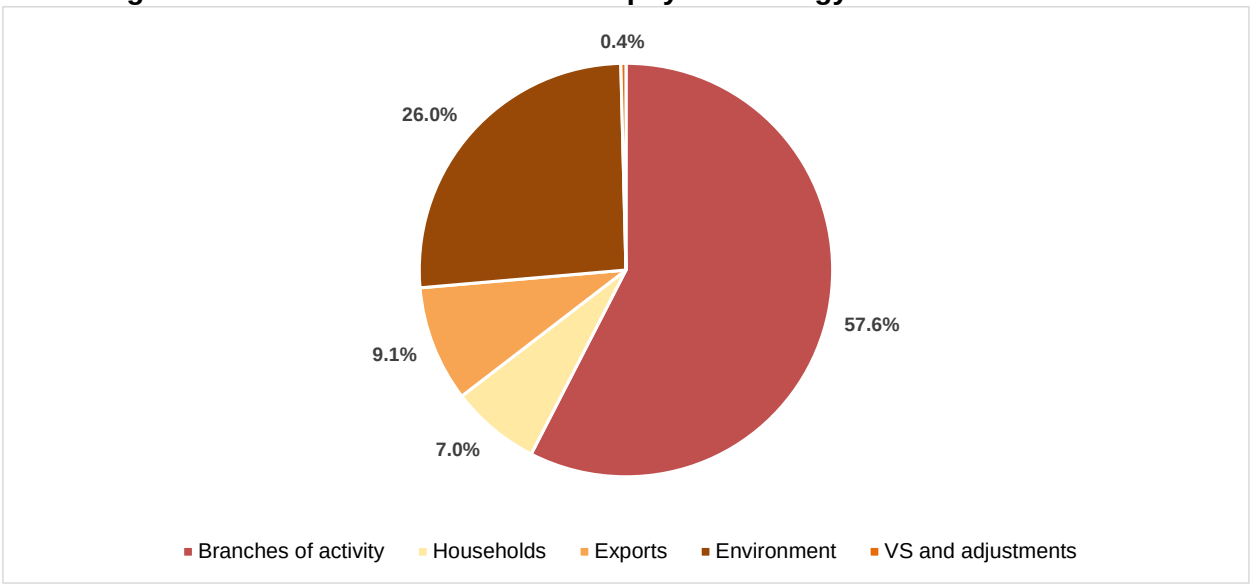
Energy destination. . Year 2015

Unit: thousands of terajoules

	2015	%	Inter-annual variations %
Branches of activity	10,903.4	57.6	4.2
Households	1,324.7	7.0	4.3
Exports	1,714.8	9.1	-5.0
Environment (energy losses)	4,920.0	26.0	4.0
V.S. and adjustments	74.9	0.4	..
Total	**18,937.8**	**100.0**	**2.9**

1. V.S. (variation in stock) and statistical adjustments.

Percentage distribution of the destination of physical energy flows. Year 2015



Energy destination by type of energy flux. Year 2015

Unit: thousands of terajoules

	Branches of activity	Households	Exports	Environment	V.S. and adjustments	Total
Natural energy resources	**1,365.8**	**..**	**..**	**..**	**..**	**1,365.8**
Energy products	**9,478.5**	**1,324.7**	**1,714.8**	**..**	**-0.5**	**12,517.4**
Extractive industry products.	5,865.0	130.1	199.8	..	-117.4	6,077.5
Coke and refined petroleum products	2,631.2	799.3	1,421.4	..	51.2	4,903.1
Biofuels	180.1	130.6	39.3	..	-3.2	346.8
Electricity and heat	802.2	264.7	54.3	..	68.8	1,190.0
Energy waste	**55.2**	**0.0**	**0.0**	**4,920.0**	**79.3**	**5,054.5**
Total[1]	**10,903.4**	**1,324.7**	**1,714.8**	**4,920.0**	**74.9**	**18,937.8**

1. The total by branch of activity and V.S. and adjustments include statistical discrepancies.

By the methodological agreement of accounts, 100% of the natural energy resources are used by the branches of activity .

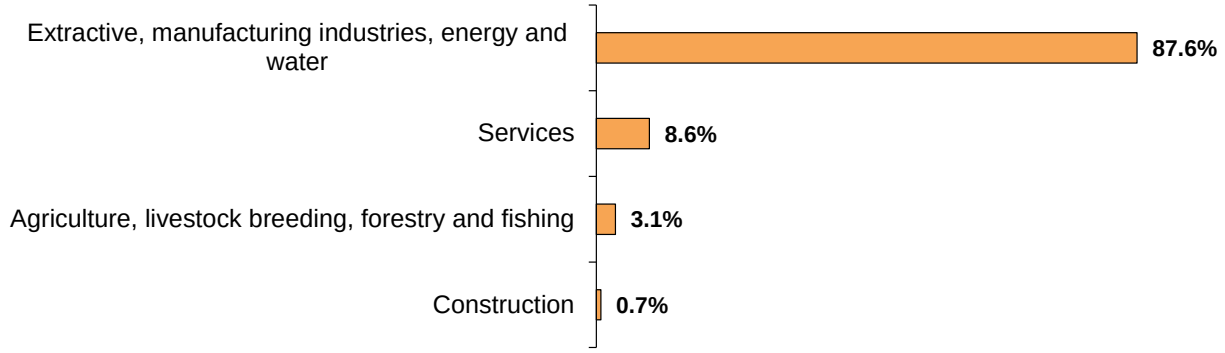
In relation to the total amount of energy used, the two productive sectors which consumed the most were the Extractive and manufacturing industries, and energy and water (with 87.6% of the total) and Services (8.6%).

Energy destination by type of energy flux and activity branch. Year 2015

Unit: thousands of terajoules

	Agriculture, livestock breeding, forestry and fishing	%	Extractive, manufacturing industries, energy and water	%	Construction	%	Services	%	**Total**
Natural energy resources	195.7	14.3	1,170.1	85.7	0.0	0.0	0.0	0.0	1,365.8
Energy products	139.4	1.5	8,321.7	87.8	78.8	0.8	938.6	9.9	9,478.5
Energy waste	0.0	0.0	55.0	99.6	0.0	0.0	0.2	0.4	55.2
Total	**335.1**	**3.1**	**9,550.8**	**87.6**	**78.8**	**0.7**	**938.8**	**8.6**	**10,903.4**

Percentage distribution of physical energy flows by branch of activity



Physical trade balance of energy products

The physical trade balance of energy products, understood as the difference between imports and exports, registered a negative balance of 3,573.8 thousands of TJ in 2015.

By components, imports form Extractive industry products represented 82.6% of the total, while that of exports was just 11.7%, which resulted in a negative balance of 4,166.9 thousands of TJ.

Energy products that generated a positive trade balance were: Coke and refined petroleum products, 572 thousands of TJ, Biofuels, 17.4 thousands of TJ, and Electricity and heat, 0,5 thousands of TJ,

Components of the physical trade balance Year 2015

Unit: thousands of terajoules

	Physical trade balance	Imports	%	Exports	%
Energy products	**-3,573.8**	**5,288.7**	**100.0**	**1,714.8**	**100.0**
Extractive industry products.	-4,166.9	4,366.7	82.6	199.8	11.7
Coke and refined petroleum products	575.2	846.2	16.0	1,421.4	82.9
Biofuels	17.4	21.9	0.4	39.3	2.3
Electricity and heat	0.5	53.8	1.0	54.3	3.2

1. *According to the Account methodology, nuclear fuels are not considered as an import. During the years 2014 and 2015, nuclear energy used increased by 618.9 TJ.*
2. *According to the methodology, natural resources are not imported or exported, just energy products.*
3. *Waste imports and exports are not significant.*

Methodological note

The Environmental Accounts (EA) is a composite statistical operation whose overall objective is to integrate environmental information in a coherent way into the central system of National Accounts, following the System of Integrated Environmental and Economic Accounting methodology (SEEA) developed by the United Nations, which constitutes the conceptual framework of the EA.

Regulation (EU) No. 691/2012 of the European Parliament and Council of 6 July 2012 in relation to the European environmental-economic accounts, constitutes the reference framework for concepts, definitions, classifications and common accounting standards for processing the Environmental Accounts and includes a section of this account, for annual submission to the European Union.

The Physical Energy Flow Accounts (PEFA) record flows of energy between the environment and the economic system of a country, within the economic system, and the economic system (and households) to the environment. It also calculates the flows of energy products with the rest of the world (imports and exports). The main external source of primary information for its processing is the Energy Surveys carried out by the Ministry of Energy, Tourism and Digital Agenda (METDA). For its accounts processing, it uses information taken from the National Accounting and structural business statistics and household budget surveys, carried out by the INE.

Energy flows are classified into three categories: natural resources (energetic) which are extracted from the environment to be used in economic production processes, products (energetic) which are produced during such processes by branches of economic activity, waste (energetic) that is generated in the economic production processes and in the consumption of energy products by households.

Furthermore, the environment acts as an energy waste receptor in a solid, liquid and gaseous state or energy in heat form. Most of that waste is in dissipated heat form during the burning of energetic materials. A small part of the energy waste is stored in the stocks for further processing, or included within non-energy use products (such as plastics).

Stock changes refer to the increase/variation of the stock of products or energy waste (landfills or energy incorporated in products).

The differences (statistics) between the energy statistics and the account are due to measurement inaccuracies when converting mass and volume units into terajoules, to imbalances between the supply and use, and to the existence of unavailable information.

You can find the methodology of this account is set out on the INE website (http://www.ine.es/en)