



# Energy Pricing for Households in Europe

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**Abstract:** Every year the energy consumption of households increases. In this regard, the cost of the consumed energy becomes an essential part of the budget of each household. Because European countries import a significant part of required to them of energy resources, the prices of electricity and natural gas for households in these countries are higher than in other countries. However, the levels of abilities of households to pay the bills for the consumed energy in different countries are different. In this work we have tried to explore the relationships between the average salary and the prices for the most important energy resources for households in different European countries. These studies have shown that some relationships between salary and energy prices have impact on the political situation in some countries. Therefore it's necessary in the energy pricing for households taking into account the levels of the household budgets of their own country.

**Keywords:** Energy, Energy Pricing, Economy, Marketing

## 1. Introduction

With the development of modern society, improvement of the living standards, more energy is used at home. None of the modern homes today can do without energy resources. Energy charges are a significant part of the family budget expenses. Therefore energy pricing for households is a subject to review and adjustment by each country. This question is particularly important for European countries since these countries have the highest energy consumption per capita and the highest energy prices. High energy consumption indicators of the population in North America and in Europe are due to climatic conditions and a higher standard of living than in other continents.

Table 1. Electricity consumption per capita by population in the world.

	Country	Average electricity consumption by population in 2011, kWth per capita
1	Norway	7350
2	USA	4590
3	France	2390

	Country	Average electricity consumption by population in 2011, kWth per capita
4	UK	1840
5	Germany	1760
6	Spain	1700
7	Greek	1420
8	Ukraine	1384*
9	Czech Republic	1350
10	Bulgaria	1300
11	Italy	1160
12	Russia	915
13	Польша	760
14	Турция	610

Source of information [1]

\*Source of information-[2].

## 2. Main Part

To understand what the needs are and what energy is consumed by the population in different countries, we look at the structure of their consumption according to the types of needs and energy types (see tables 2 and 3 below).

Table 2. Energy Consumption per Household by Final Energy Use (Gj/household/year).

Country	Common consumption	Space heating	Space cooling	Water heating	Cooking	Water heating and cooking	Lighting and other	Kerosene for lighting	Other
USA	101	46	6	17	4		25		3
Australia	53	21		15	3		14		

Country	Common consumption	Space heating	Space cooling	Water heating	Cooking	Water heating and cooking	Lighting and other	Kerosene for lighting	Other
UK	83	50		18	2		10		3
France	74	54		7	4		9		
Germany	74	58		7	2		7		
Japan	41	11	1	14	3		12		
South Korea	58	35		10	4		9		
China-urban	18	8	1			7	2		
China-rural	55	20				33	2		
India-urban	15					10	4	1	
India-rural	24					21	1	2	
Vietnam	6					1	3	2	

The source of Information: [3]

*Table 3. Energy Consumption per Household by Energy Type (Gj/household/year).*

Country	All sources	Kerosene	LPG	Natural gas	Coal	Electricity	Fuel wood	Agricultural waste	District heating	Other
USA	101	7	4	48	4	38				
Australia	53	1	1	17		24	10			
UK	83	5	1	56	3	17				1
France	74	15	3	24	1	19	12			
Germany	74	23	1	27	1	13	5		4	
Japan	41	10	6	10		15				
South Korea	58	18	6	21		10			3	
China-urban	18	3		2	7	4			2	
China-rural	55				8	2	18	26		1
India-urban	15	3		3	4	5				
India-rural	24	2				1	18			3
Vietnam	6						1	2		3

The source of information: [3]

The data in Table 2 demonstrates the various needs of the end consumer of energy resources. The basic needs of the population for energy is space heating, hot water, lighting and home appliances. The Table 3 shows the structure of the use of energy by type. These two tables reflect the level of development of the society in different countries, the conditions in which people live and the availability of certain natural resources. The population of the more developed countries and the more northern countries consume greater amounts of energy than the population of the less developed countries and countries with warm climate. Therefore the greatest energy consumption of one household per year is in the United States and the United Kingdom and the lowest is in Vietnam. The difference between the energy consumption in the United States and Vietnam is about 17 times.

There is a difference in the energy consumption of urban and rural populations. The urban population of China and India consume significantly less energy than rural. Natural gas and electricity are the main energy sources, which are used in everyday life European countries have.

These two tables show that the consumption of energy by households with the development of society will increase as natural gas and electricity in the near future will remain the main energy used by people in everyday life.

Taking into account the above factors we will consider the pricing of natural gas and electricity for the population as a major issue in the general policies of each country and as

such, the matter that can significantly affect the well-being of the population.

Since energy consumption in the European countries is a significant proportion of the budget of each European family we consider the current price of natural gas and electricity for the population through the prism of the average wage in European countries. To make it easier to compare countries with each other we divide them into several categories for research and take the most prominent representatives of these categories.

Category A – countries with the average salary of \$2,000 to \$3,000 per month.

Category B – countries with the average salary of \$1,000 to \$2,000 per month.

Category C – countries with the average salary of \$500 to \$1000 per month.

Category D – countries with the average salary up to \$500.

*Table 4. Country with the average salary of \$2,000 to \$3,000 per month.*

	Country	Average salary, \$/month (in 2014)
1	UK	3246
2	France	2660
3	Germany	2568
4	Italy	2404
5	Spain	2019

Source of information: [13]

**Table 5.** Country with the average salary of \$1000 to \$2000 per month.

	Country	Average salary \$/month (in 2014)
1	Estonia	1052
2	Greece	1023

Source of information: [13]

**Table 6.** Country with the average salary of \$500 to \$1000 per month.

	Country	Average salary \$/month (in 2014)
1	Czech Republic	877
2	Poland	843

Source of information: [13]

**Table 7.** Country with an average salary up to \$500.

	Country	Average salary \$/month (in 2014)
1	Romania	498
2	Bulgaria	416
3	Belarus	397
4	Moldova	243
5	Ukraine	206

Source of information [13], [8], [9], [11]

In order to understand the effect of the state on the level of average household income, we have indicated in the tables the average salary levels, and determined the relationship between the minimum established by the state and the average income of each country.

And now we will look at the price of natural gas and electricity in comparison to the medium and minimum levels of income in different categories of population and the possibility of improving the situation in some countries.

### 2.1. Natural Gas Prices

Natural gas prices for the population in Europe are very dependent on the imports of the natural gas, mainly from Russia. Therefore the price of natural gas for the population depends to some extent on the distance from country that is the main supplier of this type of fuel. The farther the selected country is from Russia the higher is the income and price for the natural gas. Countries located closer to Russia have lower level of development and consequently lower income, however, these countries have the ability to lower prices for natural gas as the cost of transportation to the borders of these countries is much cheaper. Below we will further consider the relationship between the income per capita and prices for 1000 m<sup>3</sup> of natural gas. (Or, respectively, consumption).

**Table 8.** Country of category A and their natural gas prices for households.

	Country	Average salary \$/month (in 2014)	Natural gas prices for households, \$/1000m <sup>3</sup>	% prices in the salary
1	UK	3246	589	18%
2	France	2660	657	25%
3	Germany	2568	546	21%
4	Italy	2404	658	27%
5	Spain	2019	761	38%

Source of information: [13], [14]

**Table 9.** Country of category B and their natural gas prices for households.

	Country	Salary per month, \$/month (2014)	Natural gas prices for households, \$/1000m <sup>3</sup>	% prices in the salary
1	Estonia	1052	393	37%
2	Greece	1023	766	75%

Source of information: [13], [14]

**Table 10.** Country of category C and their natural gas prices for households.

	Country	Salary per month, \$/month (2014)	Natural gas prices for households, \$/1000m <sup>3</sup>	% prices in the salary
1	Czech Republic	877	500	57%
2	Poland	843	436	52%

Source of information:[13],[14]

**Table 11.** Country of category D and their natural gas prices for households.

	Country	Salary per month, \$/month (2014-2015)	Natural gas prices for households, \$/1000m <sup>3</sup>	% prices in the salary
1	Romania	498	169	34%
3	Belarus	397	168	42%
4	Moldova	243	355	146%
5	Ukraine	206	334	162%

Source of information:[13],[8],[9],[11],[14]

These tables indicate that the population in the majority of countries with lower income use all the features and benefits of a close geographical location to the country - main supplier of natural gas to Europe. However, ignoring the objective conditions by some countries leads to an unstable political situation in those countries. Adjusting the price of natural gas, it is necessary to consider not only the cost, the needs of the country in filling the budget, but also a prudent relationship between the ability of the population to pay bills without a sharp reduction of its well-being and needs of the gas industry and the state.

### 2.2. Electricity Prices

Electricity prices follow the similar pattern as many power plants use natural gas as fuel in the production of electrical and thermal energy. However, the overall situation in the electricity pricing is much better. With the development of market relations in the electricity industry, the opportunity to trade electricity between different regions of the country and even between countries themselves provides the great opportunity to align production schedules and reduce the price indices due to the timing differences and lower losses in the transmission systems.

Development of unconventional sources of electricity production provides additional opportunities for expanding of the frontiers of the domestic energy use and improving the ecological situation. The best ratio of the average wage and the cost of electricity for the population indicate the prospects for its further use.

**Table 12.** Country of category A and their electricity prices for households.

	Country	Salary per month, \$/month (2014)	Electricity prices for households, \$/100 kWh	% electricity prices in salary
1	UK	3246	25,7	0,8
2	France	2660	21,4	0,8
3	Germany	2568	40,3	1,6
4	Italy	2404	32,9	1,4
5	Spain	2019	30,3	1,5

Source of information: [13], [5,6]

**Table 13.** Country of category B and their electricity prices for households.

	Country	Salary per month, \$/month (2014)	Electricity prices for households, \$/100 kWh	% electricity prices in salary
1	Estonia	1052	17,6	1,7
2	Greece	1023	23,8	2,3

Source of information: [13], [5,6]

**Table 14.** Country of category C and their electricity prices for households.

	Country	Salary per month, \$/month (2014)	Electricity prices for households, \$/100 kWh	% electricity prices in salary
1	Czech Republic	877	17,4	2,0
2	Poland	843	19,1	2,3

Source of information: [13], [5,6]

**Table 15.** Country of category D and their electricity prices for households.

	Country	Salary per month, \$/month (2014-2015)	Electricity prices for households, \$/100 kWh	% electricity prices in salary
1	Romania	498	17,4	2,5
2	Bulgaria	416	11,2	2,7
3	Belarus	397	7,6	1,9
4	Moldova	243	12,2	5
5	Ukraine	206	3,7	1,8

Source of information: [13], [8], [9], [11], [5, 6]

### 3. Conclusions

The statistical data on the income levels of different countries and the prices for the main types of energy demonstrate the capabilities of various countries to provide a decent standard of living for its population.

While establishing the energy prices for the population, one should remember that these prices have a very significant impact on the budgets of each household. Therefore it is necessary to make use of all the opportunities available to decrease such price in order to avoid the negative impact on the overall political situation in the country due to worsening of the living standards of the population.

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