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 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, kWh per capita |
|---------|------------------------------------------------------------------|
| 1       | Norway                                                                 |
| 2       | USA                                                                   |
| 3       | France                                                               |
|         | 7350                                                                |
|         | 4590                                                                |
|         | 2390                                                                |

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                       | 14               | 3                    |       |
| Australia | 53            | 21            | 15            | 3             |         |                         |                  |                      |       |

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

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

| Country  | Average salary, $/month (in 2014) |
|----------|-----------------------------------|
| 1        | UK                                |
| 2        | France                            |
| 3        | Germany                           |
| 4        | Italy                             |
| 5        | Spain                             |

Source of information: [13]
between the minimum established by the state 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$^3$ of natural gas. (Or, respectively, consumption).

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

| Country | Average salary $/month (in 2014) |
|---------|---------------------------------|
| 1       | Estonia                         |
| 2       | Greece                          |
| 1       | Estonia                         |
| 2       | Greece                          |

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                  |
| 2       | Poland                          |
| 1       | Czech Republic                  |
| 2       | Poland                          |

Source of information: [13]

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

| Country | Average salary $/month (in 2014) |
|---------|---------------------------------|
| 1       | Romania                         |
| 2       | Bulgaria                        |
| 3       | Belarus                         |
| 4       | Moldova                         |
| 5       | Ukraine                         |

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.

2.2. 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 |
|---------------|---------------------------------|------------------------------------------|-------------------------------|
| Czech Republic| 877                             | 17,4                                     | 2,0                           |
| 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 |
|---------|------------------------------------|------------------------------------------|-------------------------------|
| Romania | 498                                | 17,4                                     | 2,5                           |
| Bulgaria| 416                                | 11,2                                     | 2,7                           |
| Belarus | 397                                | 7,6                                      | 1,9                           |
| Moldova | 243                                | 12,2                                     | 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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