
THE EVOLUTION OF PRIMARY ENERGY RESOURCES IN THE CONTEXT OF THE CURRENT ENERGY CRISIS

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Abstract

Primary energy, as well as energy in general, after October 2021 entered a period of great crisis, in the sense that resources are about the same but prices have risen sharply.

The resources of primary energy, theoretically, increased by 7.6% and those of electricity by 6.5% compared to the same period of the previous year. However, prices have continued to rise due to the international situation, the conditions under which they are produced and, above all, the costs involved in using primary energy resources for energy production.

In this article, we aimed to highlight the evolution of primary energy reserves based on data recorded in 2021 in order to extrapolate and engage in a discussion on subsequent periods that will follow.

We used the methodology specific to the statistical works by taking over and comparing the indicators provided by the National Institute of Statistics, on energy resources, on situations registered in domestic production and imported production. There is less talk about exports because it has been tempered or reduced.

Primary energy resources jeopardize, through rising prices, the situation that will be recorded in the next period in relation to rising prices in all areas because electricity, natural gas resources and everything else ensure both their price increase but indirectly, and all prices in the national economy, which will be reflected in the consumer price index.

Keywords: energy, resources, prices, crises, developments.

Introduction

In this article we started from the analysis of the main primary electricity resources in the first ten months of 2021 compared to the same period in 2020.

Domestic production increased and imports also showed a slight upward trend.

The structured internal resources show the reserves that Romania has at a given moment.

We performed analyses on the situation in October 2021, which we compared with the previous month or with a similar month in the previous year. We then performed an analysis for the first ten months of 2021, compared to 2020, using the indicators provided by the National Institute of Statistics.

We also conducted a study to analyse the balance of electricity by total resources and destinations. Thus, the production is still carried out in conventional thermal power plants hydroelectric power plants, nuclear power plants, wind power plants, photovoltaic and imported solar power plants.

And the destinations were for the final consumption in the economy, public and public lighting, the consumption for technology in networks and stations as well as the export realized from the surplus that was realized.

The information underlying these assessments was provided by the press releases provided by the National Institute of Statistics, some of which were also linked to data published by Eurostat.

Literature review

Anghel, Anghelache, Manole and Carp (2017) presented the strategy at European Union level regarding the origin of the energy resources used, what was the evolution at the level of the member countries and how the internal energy demand evolved. Hirth (2015) discusses the need for optimal development between solar and wind energy in order to achieve the well-being of energy sources. Huber, Dimkova and Hamacher (2014) also focus on the two types of energy when analyzing the integration of renewable sources in the European energy system. Anghelache and Grigorescu (2020) present the correlation between resources and production, in the analysis of primary energy resources in 2019. Lund, Lindgren, Mikkola and Salpakari (2015) conducted a study that aims to respond to the opportunity to make the energy system more flexible. Renewable energy sources have focused on Edenhofer, Hirth, Knopf, Pähle, Schlörner, Schmid and Ueckerdt (2013), Wagner (2014), and Söderholm and Klaassen (2007) have focused on the use of wind energy at European level.

Methodological clarifications, data, results and discussions

Regarding the data source, I relied on those provided by the National Institute of Statistics, which conducts monthly statistical surveys on short-term indicators in industry and on the production of heat and electricity. For production from renewable sources take data from C.N. Transelectrica S.A. and with regard to nuclear energy, a plant efficiency of 35.11% is used.

The electricity balance is drawn up on the basis of data provided by the same national company mentioned above and by the electricity distribution companies.

The statistical research is of selective type, the extraction of the sample is done according to the stratified selection survey, it is random and without return within the layers, and the stratification variables are the economic activity and the size class of the enterprises.

To ensure comparability, data from 150 economic operators with high economic potential are used, exhaustive research, the maximum allowed error of estimates is $\pm 3\%$, the representativeness was calculated based on turnover is 96.9%.

Data on international trade are collected by the General Directorate of Customs within the National Agency for Fiscal Administration, C.N. Transelectrica S.A., S.N.T.G.N. Transgaz S.A. and through statistical statements.

Primary energy resources (thousand tonnes oil equivalent)

Table no. 1

	1.I - 31.X. 2021	1.I-31.X.2021 to 1.I-31.X.2020								
	Differences (\pm)				- % -					
	To tal	Prod.	Imp.	Total	Prod.	Imp.	Total	Prod.	Imp.	
Resources - total	27887,5	15441,1	12446,4	+1965,7	+429,5	+1536,2	107,6	102,9	114,1	
from which:										
Coal net	3068,4	2689,5	378,9	+462,0	+421,8	+40,2	117,7	118,6	111,9	
Oil	8112,5	2599,0	5513,5	-162,6	-112,9	-49,7	98,0	95,8	99,1	
Natural gases	8288,7	6005,6	2283,1	+948,5	+21,0	+927,5	112,9	100,4	168,4	
Hydroelectric, wind, solar, nuclear heat, and imported electricity	4699,4	4147,0	552,4	+109,9	+99,6	+10,3	102,4	102,5	101,9	
Imported petroleum products	3263,2	-	3263,2	+489,0	-	+489,0	117,6	-	117,6	

Source: <https://insse.ro/>

We note that the total resources increased in the first ten months of 2021 compared to the similar period of 2020 by 7.6%, the result being obtained by an increase in production by 2.9%, respectively by an increase in imports

by 14.1 %. Currently 55% of total resources are from domestic production. As we can see, only in the area of crude oil we have a total decrease of 2%, amid a reduction in imports by 0.9% and a decrease in production by 4.2%.

Coal-based primary energy resources increased by 17.7% with an increase in production of 18.6% and an increase in imports of 11.9%. In the area of green energy, there were total increases of 2.4%, with an increase in production of 2.5% and an increase in imports of 1.9%.

Imports of petroleum products increased by 17.6% to 3263.2 thousand tons, which translates into an increase of 489 thousand tons compared to the first ten months of the previous year.

In the period January - October 2021, the electricity resources were 55533 million kWh, increasing by 3409.7 million kWh compared to the same period of the previous year.

Electricity balance data

Table no. 2

	1.I-31.X.2021	1.I-31.X.2021 to 1.I-31.X.2020	
	million kWh	Differences (±) - million kWh -	%
Resources - total	55533,0	+3409,7	106,5
- Production	49110,2	+3289,9	107,2
- in classical thermal power plants	17995,0	+1838,7	111,4
- in hydropower plants	15137,2	+2252,4	117,5
- in nuclear power plants	9243,4	-158,1	98,3
- in wind power plants	5152,9	-627,4	89,1
- in photovoltaic solar power plants	1581,7	-15,7	99,0
- Import	6422,8	+119,8	101,9
Destinations - total	55533,0	+3409,7	106,5
- Final consumption	46125,7	+2307,4	105,3
- in economics	34267,9	+1510,2	104,6
- public lighting	428,2	+10,7	102,6
- population	11429,6	+786,5	107,4
- Own technological consumption in networks and stations	4411,0	+196,1	104,7
- Export	4996,3	+906,2	122,2

Source: <https://insse.ro/>

We notice that in the field of electricity approximately 11.6% represent imports, the rest representing the production from classic thermal power plants, hydroelectric power plants, nuclear power plants, wind power plants, respectively photovoltaic power plants.

Regarding electricity destinations, it notes that about 83% go to final consumption (economy, population and public lighting). Consumption of the population representing up to 25% of final consumption (24.8%).

The situation on the line of electricity production increases by 7.2% in total, with increases of 11.4% and 17.5% in the area of conventional thermal power plants and hydropower plants, respectively. On the other hand, solar power plants decreased by 1%, wind power plants decreased by 10.9%, and nuclear power plants produced 1.7% less in the first ten months compared to the same period. the previous year. Imports increased by 1.9% compared to the first ten months of 2020.

Out of the total of 55533 kWh, 61.7% went to the economy, the consumption increasing by 4.6%. For public lighting, there was an increase of 2.6% in the first ten months of 2021 compared to the same period in 2020. Consumption of the population also increased by 7.4%, while exports increased by 22.2%.

Conclusions

From the ones presented in this article, some conclusions emerge, especially theoretical ones. Thus, the balance of electricity is maintained in an adequate structure compared to last year when, until July, there was an increase in most producers, except for electricity from nuclear and wind power plants where there were decreases. . However, growth in the other plants has ensured balance in this area.

However, the onset of rising electricity and gas prices will have a particularly negative effect on the national consumer price index as the particular increases in these two product categories will be reflected in rising prices in all other areas taking into account the fact that electricity and natural gas are consumed in any field.

Another conclusion is that this increase in electricity and gas prices or even home heating will have a devastating effect on the population during the winter, for which the conditions are not guaranteed to compensate for the increases but there is no prospect that these growths should be tempered in some way.

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