

# Energy consumption and economic activity



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## Abstract

Nowadays, most analysts agree that energy is crucial for the global economic output, as it constitutes the backbone of international economy. Global trade, industry and ultimately our current lifestyle could not be maintained without it. As the world economy improves and new opportunities are created, it is expected that energy demand will increase significantly in the future. In recent decades, its significant role is understood by a lot of business sectors and academics, who investigate systematically the relationship between energy and economic development.

The objective of this study is to examine the causal relationship between energy consumption and economic activity.

More specifically, in the first part of the study the basic goal is the brief presentation of the indices that will be used to define and understand the term of economic growth and the contribution of energy in the process of economic development, and the second part presents the panel data econometric investigation of statistical package Stata with a view to investigate the existence or non existence of a causal relationship between the variable energy consumption and economic growth. The empirical analysis is performed along a check. Specifically, the set of test examines whether the consumption of electricity affects economic growth. The analysis focuses on a specific sample of countries comprising the 28 member states of the European Union. In addition it is significant to underline that for this econometric approach the economic development will be expressed through the human development index (HDI for consecutive years from 2010 to

2014), which is the most widely used measure of development, while in terms of energy, the variable is the per capita electricity consumption (EPC for consecutive years from 2010 to 2014).

While there is a long tradition in economics of development, in the last few years the term “ economic development” has become part of our daily lives. Sustainable, green, urban, regional are just some of the characterizations we’ve seen, in various publications, articles, books and statements of personalities of the political, economic and academic space, to accompany the development. What do we mean by ‘ economic development’ and why the last few years it has gained so much importance?

It’s not easy to give a comprehensive and clear answer to the questions above. To get to the definition of the term “ development”, it is good to begin from the examination of another term, that of “ growth”. There are not few those who confuse the two terms. However, it is important to stress that the two terms are not identical. While so, when we look at the economic growth the focus of attention is directed at a very specific variable, the GDP(Gross Domestic Product), the study of economic growth it is difficult to focus on only one factor. The difficulty in this lies in the multidimensional nature of economic development as a concept. So according to all of the above, the concept of economic development is a changing, dynamic concept with a strong element of progression. This fact makes difficult the precise definition of. However, the diversification of the economic growth is evident.

Indicators to measure the Development Of

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The measurement of development and in particular sustainable development, as has been mentioned above is a challenge due to the multidimensional and dynamic nature of the. The investigation and measurement of development requires a series of indicators that touch the economic, social, environmental and institutional sphere in order to form an overall picture of the level of the country under consideration.

### Human Development Index

Through the official page of the United Nations, and, more specifically, the first Report on Human Development introduced for the first time a new index for measuring development, the Human Development Index (Human Development Index). This indicator comprises three individual indices: life expectancy, educational attainment and income.

Life expectancy is calculated with the average life expectancy at birth of an individual, the level of education sums the adult proportion of the population that knows the bible and the enrollment rates in primary, secondary and tertiary education and end the income represented by the real GDP per capita.

The prices of the hdi range in a scale with the lowest point of the zero and superior to the unit and is essentially the non-weighted numeric average of the three above indicators. The gradient on the basis of which separate the countries according to the values of the following

### Countries of High Human Development

The importance of the index and the contribution of a marker was decisive, since by the time that was put at the disposal of economists is perhaps the most popular indicator for measuring development.

### Europe and Economic Development

The European Union acting as a single market consisting of 28 countries, has evolved into a global trading power. Covering only 7 % of the world's population, the EU's trade with the rest of the world, nearly 20% of total world exports and imports. Important part of this commercial success is due to the free movement of goods within the European borders, after two-thirds of the total trade of EU countries is with other countries of the European Union .

The economic displacement is indisputable if one takes into account that the GDP is now larger than that of the united states (Page, 2014). Despite the fact that the European Union is challenged in the last few years from a severe recession , the efforts for a closer cooperation between the member create hopes for new, innovative and environmentally friendly investment projects that will create the right conditions for lasting development and prosperity.

The above data demonstrate a robust economy προδιαθίτωντας equally good performance in terms of the level not only of quantitative but also of qualitative variables of economic development. Seeing a total of the scores of the table hdi, the countries of the European Union seems to indicate a high score. However, this observation is only one side of the coin. A careful reading of this index indicates variations in prices between states, and <https://assignbuster.com/energy-consumption-and-economic-activity/>

between the different regions within the same country. In accordance with the Table these differences are apparent by creating the following groups of countries: The Nordic countries (Norway, Iceland, Sweden, Finland, Denmark), the English-speaking (Uk, Ireland) and the countries of Western Europe (Netherlands, Belgium, Luxembourg, France, Germany, Austria, Switzerland) to create a set of countries with a head start in terms of GDP per capita. The countries of Southern Europe (Spain, Portugal, Italy, Greece, Cyprus, Malta) are the second group of countries, introducing a lag in the per capita GDP in relation to the leading countries of Northwestern Europe. Finally, the countries of Eastern Europe (Hungary, Poland, the Czech Republic, Slovakia, Slovenia ), Baltic countries (Latvia, Lithuania, Estonia) as well as Romania and Bulgaria are significantly lower prices with regard to GDP per capita. As we have seen in this chapter the measurement of growth is carried out through a series of indicators.

### Eu and energy

The concept of energy is inextricably linked with the European Union. Wouldn't it be excessive if it is supported it is one that the current European edifice owes its existence to the energy and the importance of the role of the wider region.

Production, consumption and structure of energy in Europe in accordance with the table below, the gross inland energy consumption in the European Union in 2012, appears to show a slight fall of 1% in relation to the measurements of 2011. The consumption of petroleum (crude oil and other products/petroleum derivatives) still has a leading role in the European

economy, while natural gas has established itself as the second most important source of energy. The solid fossil fuels (e. x. coal, lignite) are losing more and more ground in the pie of energy resources, soil, winning the renewable energy sources which are currently in the last place in the table. The advantage over the RES still retains the nuclear energy which is the pre-last option of the Europeans in terms of energy sources.

On the other hand, the primary energy production in the European territory remains unchanged over the last two years to 33 million TJ (Tera Joule). The predictions, however, regarding the future rates of energy production are not particularly favorable, as well as decreasing trends are observed in the production of oil, natural gas, solid fossil fuels and nuclear energy. A positive evolution is taking place in the part of the RES, where it is observed only an increase in the production of energy by 9%. The greatest reductions are detected in order to oil products and natural gas. Nuclear energy in spite of the reductions that were initiated in the last years, still represents the largest source of primary energy production in the European Union. Finally, the hesitant entrance of non-renewable waste in the table remains almost unnoticed, with a rate that does not exceed 2%.

Observing one's tables understands easily the main points of concern of European leaders with regard to energy issues. The structure of final energy consumption in each country and the overall European rates in accordance with the table attest to the increased energy needs for oil and natural gas. The board, in turn, confirms the difficulty of Europe in responding to the coverage of energy needs. This gap arises in the energy balance is covered through the import of energy.

The investigation happened in the first chapter, set some basic foundations for the understanding of the term “ economic development” and for the importance of the factor energy in the context of the economy. Also in the previous chapter reference was made to the level of economic development in the European area (in terms of quantitative but also the qualitative side of development) and a brief review of the energy strategy of Europe in matters of energy production and consumption , composition of resources, but also the problem of energy dependence, mainly from Russia. The focus of interest in the European area that was in the first section followed by an empirical analysis in order to examine the possibility of a small the larger relationship between economic growth and energy consumption.

More specifically, the second part consists of a brief econometric investigation which will be carried out through the statistical program STATA, in order to examine the possibility of a “ relationship of causality between economic growth and energy consumption. In other words, in this section, the main objective is to examine whether the energy consumption affects economic growth.

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Variables: In most studies of this kind of economic development are examined through a particular pointer that is none other than the GDP. In the first part, made specific reference to the different meaning of the term economic development and economic growth, where it was noted that the GDP as an indicator is suitable for measurement of growth but insufficient for measuring development. So in this analysis, the economic growth will be expressed through the human development index (HDI for years 1995–2010)<sup>11</sup>, which is the most popular indicator for measuring development. In terms of energy, the first variable is the per capita consumption of electricity (kilowatt hour/capita for the years 1995–2010) <sup>12</sup>, and the second is the per capita natural gas consumption (cubic meter/capita for the years 1995–2010)

As it has been pointed out above, until today, the existing empirical findings on the causal relationship between energy consumption and economic growth is not characterized by uniformity. This is because the econometric approach, time periods and the sample of countries analyzed in each survey vary significantly.

the results of The econometric study suggest that there is no causal relationship between energy consumption (per capita electricity consumption and per capita consumption of natural gas) and the index of human development for the countries of the European Territory (with the exception of Cyprus and Malta). At this point, we should mention the limitations that existed in the econometric investigation. The econometric analysis ideally would be in the data/observations of at least 30 consecutive years (1980–2010). Most countries, however, are characterized by incomplete

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statistics, during the period from 1980 to the early 90's, which limited the possibilities of analysis on data/ observations 16 consecutive years (1995–2010).

Finally, the application of the above econometric analysis variables and the consumption of energy derived from renewable energy sources is an interesting option for future research, as well as the existing statistical data for the use of renewable energy sources is not enough. Also, the application of the analysis in most of the development indicators would offer a more integrated position.