

Challenges and dilemmas of the transformation of electrical energy from thermal to alternative energy in Kosovo

Author1¹, Author2²

¹ Mustafë Kadriaj, PhD, College of Business, Pristina, Republic of Kosovo, Prof,Ass.Dr

² Albana Jeminaj, PhD, Infinit Academy Institute Kosovo, Republic of Albania, Dr.sc

Abstract

Former United Nations Secretary-General Ban Ki-Moon said at the Rio Earth Summit in 2012: "The road ahead is long and difficult." Sustainable development represents social development, which meets current needs, without harming the needs of future generations. In this respect, energy and the environment are essential factors of social development. Coal in Kosovo is the primary resource, respectively the primary producer of mechanical and electrical energy, at the same time today it is the most encouraging source for sustainable energy production in the conditions of the Republic of Kosovo. The search for finding, developing, and using energy from other renewable sources is constantly encouraged. Using various wastes and discharges of an organic nature serves to balance the need for thermal energy (heat) and electricity in the energy sector.

Keywords: Electricity, Alternative energy, Sustainable development, and Environment

Scientific definition

The term sustainability reflects the need for a careful balance between economic growth and the preservation of the environment. (Todaro, Smith, Minxhozi, Malaj, Bexheti, 2018, p. 530). There are over 100 definitions of sustainable development, but the best known and most classic is that of the World Commission on Environment and Development, "Our Common Future", otherwise known as the Brundtland Report. According to this definition, "Sustainable development is the development that meets the needs of the present without compromising the opportunities of future generations to meet their needs. Sustainable development maintains a delicate balance between human needs to improve material and moral well-being on the one hand and the conservation of natural resources and ecosystems on which we and future generations rely. Sustainable development involves economic growth along with protecting the quality of the environment, where one reinforces the other. The essence of this form of development is a stable relationship between human activities and the natural world, which does not diminish the prospects for future generations to enjoy a quality of life at least as good as ours. The guiding principles are that humanity should not take from nature more than nature can compensate. This means adopting lifestyles and development paths that respect and work within natural limits. The American President John F. Kennedy (1961-1963) has emphasized that "it is our duty to our time and our generation to pass on to those who come after us, as our ancestors passed on to us, our riches and our beauties. Natural. (Guri, Guri, Guri, 2015, pp. 66,67). The sustainable economic and social development of Kosovo is a challenge, which is being posed not only before the state institutions but increasingly becoming a serious preoccupation of Kosovar science. Efforts are being made to identify key points. Efforts are being made to identify the main points, which should be supported, and comparative advantages for a more intensive economic development. Identifying potentials, as well as defining advantages by science, requires an additional commitment of planning and decision-making factors that the identified potentials are used through the development and implementation of national development policies and plans. (Authors, 2012, p. 5)

¹ Mustafë Kadriaj, PhD, College of Business, Pristina, Republic of Kosovo, Prof,Ass.Dr

² Albana Jeminaj, PhD, Infinit Academy Institute Kosovo, Republic of Albania, Dr.sc

The history of the development of the meaning of energy is very wide, it is one of the basic concepts of physics not only the formation and existence of our planet but also the formation and existence of the universe, billions of years ago, are directly related to energy. While energy is the main meaning of the formation of the existence of the universe, there is not and cannot be an adequate definition that would fully describe this meaning in fewer words, as it is presented in many infinite forms and sizes. Energy is everywhere and always, from the nucleus of the atom to the universe itself, from microorganisms to the very composition of our planet (Begolli, 2018, p. 28). Energy is the branch of physics that deals with the study of energy. Branch of technology that deals with the conversion and use of different types of energy, branch of economics that deals with energy sources and ways of its use. (Samara, Haxhillazi, Shehu, Feka, Memisha, Goga, 2006). Thermal energy is the rate at which fuel can be burned, with a continuous maximum coefficient, multiplied by the net chlorine value of the fuel and expressed in megawatts of energy. Energy can be obtained from the sun, water sources, fuels, earthquakes, volcanoes, wind, sea waves, etc. (Bërxfholi, 2008, p. 49)

Renewable energy is a form of energy created from inexhaustible sources. Like the sun and the wind. Electricity - energy produced from water, wind, thermal energy, and nuclear energy, building the respective industry of production of this energy. (Kabashi, Shehu, Lama, 2015, pp. 2004, 2005, 2006)

Scientific treatment

Many economists do not accept the idea that the relationship between supply and demand is determined by mechanical adjustments made by the market. They show the difference between this stream of thought, inherited from the eighteenth century, and the reality of modern societies. Here I want to talk about the regulatory role of enterprises and states. Certainly, it is not the market that articulates and coordinates the production activities, the enterprises themselves play a big role. It is another matter then whether they operate by competing with each other and should meet customer expectations. The nature and evolution of this living collective being as an enterprise, constitute a fundamental dimension of the real economy. (Calame, 2011, pp. 75.76). The process of economic globalization has turned into globalization, after 1989, with the worldwide expansion of the neo-liberal economy. Across the globe, this expansion was accompanied by the expansion of capitalism, which in itself was accompanied by the dominance of financial capitalism. Continuous productive growth and development are still seen as the way out by most states. (Morin, 2016, pp. 124,125). The economic downturn of 2008 and 2009 demonstrated the need for good governance, as it reminded us that investors and financial policymakers are rushing for short-term gains, ignoring long-term risks. For this reason, we should not presume that markets are self-regulating, and intelligent (moderate) government intervention can help prevent market collapse from shocks across society. (Bremmer, 2020, pp. 231,232). Kosovo currently has available about 0.05% of the world population and about 0.008% of the land area and produces 0.08% of total world production, measured by Gross Domestic Product (World Bank, 2016). These comparisons are based on the market value of all goods and services produced in Kosovo within a year (Gross Domestic Product) compared to the market value of all goods and services produced in all countries of the world. (Authors g., 2018, pp. 42,43). It has been known since ancient times that the prosperity and economic development of a country or region is valued by underground resources and prosperity, and the search for raw materials not only in the past but even today remains an important branch of economics and one of the faculties of human well-being. (Shabani, 1997, p. 9). Sustainable development is the development of the present without compromising the opportunities of future generations to meet their needs. Energy and the environment are essential factors for sustainable development. (Group of Authors, 2014, p. 9). At the beginning of the new century, it is important to know that economic, environmental, and social goals are integrally linked and that the policies that are being developed should reflect these reports. (Group of Authors, 2014, p. 10). The impact of fossil energy generation on environmental pollution has made renewable energy a priority in many countries in Europe and the world. In this respect, wind energy is one of the main forms of creating renewable energy. However, the level of alignment, as well as the financial viability of this type of power generation, depends very much on the level of technology used in the wind turbine. (Group of Authors, 2014, p. 79). Wind energy plays a very important role in the development of sustainable energy capacities and, as a result, the number of wind turbines is constantly increasing worldwide. Wind energy is renewable energy, clean, as well as economically competitive with conventional energy generation technologies. The wind energy sector is undoubtedly the sector with the highest annual growth. In the last five years, installations of wind power generation capacities have increased on average 22.7% per year, reaching 282,430MW at the end of 2012. (Group of Authors, 2014, pp. 79.80). The first underground works in the extraction of Kosovo coal date back to the time of the First World War. After the end of this war, some small research works were done in narrow locations to compare the quality of coal and the most suitable extraction conditions. The coal reserves of the Kosovo basin before the Second World War were not known, much less those of the Dukagjini region. (Dushi, 2009, p. 28). In the past period, hydrogeological research in the area of Kosovo has not

had a long-term character and a systematic work, but for the most part, has been conducted at the request of stakeholders, most often to solve an acute problem. The basic conclusion of all research can be the assessment of groundwaters and the opportunities they offer to solve some problems in this area, generally not given the importance it deserves. (Dushi, Kosovo Mineral Resources, Volume Two, 2009, pp. 187,188). Natural resources are an important factor in economic development. They could have been a much more important development factor if investments had been more oriented towards more intensive processing of pro-regenerative and non-regenerative materials. The future development strategy should take into account these problems, where an important component is the more economical use of natural resources, taking care of the accumulated direct effects, and incorporating more rationally. (Gusia, 2010, p. 173). Whether or not Kosovo needs a new power plant does not need comment. This question, of course, even the most skilled experts will not answer immediately, without doing some preliminary studies based on the needs that Kosovo has today and will have tomorrow. So, in well-studied circumstances, Kosovar officials and experts can think about building a new power plant, interrupting the operation of the Kosovo A power plant, and modernizing the Kosovo B power plant, because these are extreme factors of environmental pollution as a risk for the health of the population. (Begolli, 2018, p. 378). In the conditions of price liberalization, monopoly of raw materials for energy (oil, gas, coal, etc.) from different countries not only on a European scale, the use of always in increasing renewable energy from developed countries, market, and effective competition remain the main influential preconditions for stable supply and use with energy-saving (efficiency). (Begolli, 2018, p. 379). A secure energy supply is, at the same time, an adequate and uninterrupted supply to consumers, regardless of energy sources. Lack of energy raw materials, which makes many countries dependent on energy imports, as they do not have production opportunities in their countries, lack of relevant investments in this sector, lack of adequate distribution network and other infrastructure, often cause serious problems and extreme uncertainty for consumers, as in the case of Kosovo, although raw materials of this type are in abundance. In the conditions of numerous possibilities for the use of alternative energies (solar, wind, water, biomass, geothermal, etc.), as well as numerous possibilities of combining many types of energies, even this problem can be reduced to a minimum. (Begolli, 2018, p. 379). The development of renewable energy sources is affected and influenced by the activity of several public institutions in the country, which include institutions of policy-making, resource management, sector regulation, and monitoring the implementation of policies and legislation. (authors, 2020, p. 539). Wind energy, among all renewable energy sources, occupies a significant place in the energy market, experiencing over the last decade the largest growth worldwide. Among the main benefits of wind energy are the environmental advantages it presents compared to the energy produced from traditional fuels. Moreover, the cost of generating electricity from wind is among the cheapest compared to the costs of electricity produced by exploiting other renewable energy sources. It is also increasingly comparable to the costs of generating electricity from fossil fuels. (authors, 2020, p. 497). Intensive efforts are being made all over the world to provide alternative energy sources, to meet the ever-increasing needs of society. Fossil resources (oil, coal, natural gas) have become very scarce and cannot afford not only the growth of the population but also the demands of modernization and continuity of life on our planet. It is a known fact that the higher the amount of energy that is consumed in Europe is of fossil origin, but their combustion has a major environmental impact on the energy sector. In addition to the pollutants that fossil fuels release when burned, they have a high content of carbon dioxide, CO₂, which is a greenhouse gas, which contributes to Climate change. Numerous materials and publications from authoritarian institutions have recently spread the idea of the urgent need to turn the chemical industry into a green industry", with demands for large masses of materials and renewable energy. (2020, p. 124). The strategy of the Republic of Kosovo for the period 2009-2018 has a special focus, in addition to the security of sustainable electricity supply, has also had the diversification of electricity sources. Lignite, given the large reserves that Kosovo has, is the primary source with which is going to be achieved basic supply, but also with renewable energy sources, which is considered important to meet market demands. (Group of Authors, 2014, p. 525).

Research and analysis

The economy and the environment are inextricably linked. For example, economic development is one of the primary reasons for climate change, but it can also solve this problem. Similarly, the study of economics is at the forefront of research on global warming, and it is economic tools - such as taxes and guidelines - that are most likely to encourage people to pollute the environment less in the future. (Conway, 2015, p. 182). In recent years, economists have increasingly focused on the important implications of environmental issues for the success of development efforts. The classic market failures lead to greater environmental degradation. Environmental degradation can hamper the pace of economic development by imposing high costs in developing countries through health-related costs and reduced resource productivity. (Todaro, Smith, Minxhozi, Malaj, Bexheti, 2018, pp. 528,529). The comparative

advantage of each state is the specialization in marketing what they produce with greater comparability productivity and lower comparative cost. (Skenderi, 2010, p. 193). Creating new products is a high-risk venture, given the high number of new products and services that fail. There have even been times when even large companies, which have long-experienced research and development departments, have created products and services that have failed. There are several ways that a new idea for a product or service can be developed, although they find it difficult to come up with new concepts. Ways new ideas can be developed:

- Be aware that something is missing in the market,
- Upgrade existing products,
- Combine the characteristics of different industries,
- Know the socio-economic trends,
- Be attentive to everything around you,
- Question any widely accepted ideas or assumptions,
- Enter the name first and then develop the product.
- Conduct an extensive market study
- Meet a market need,
- Try to gain an advantage by launching a high-quality product,
- Try that the quality, price, customer experience are from the beginning as they should be,
- Use the right distribution channels. (Lambing, R.Kuehl, 2018, pp. 78,79,80,81,82)

The water potential in Kosovo is modest, however, with new investments and projects hundreds of thousands of megawatt-hours of electricity can be extracted, especially from the large rivers in Kosovo. Hydropower plants such as Gazivoda, Zhur, Rugova have been left out and no investments have been made for the construction of any new facilities. This is due to the orientation mainly in the power plants of Kosovo, but the possibility of valorization of Thermo-mineral waters as an energy source is not excluded, especially for industry, housing heating, and especially agricultural needs. (Blaku, 2005, p. 251). In addition to the pollution problems described above, there are several other challenges to be faced within the environmental sector. As in other areas of Kosovo society, most such reform issues are closely linked to the relative levels of investment available. (Blaku, 2005, p. 337). The quality of the environment also has a direct impact on the health of society. Pollution levels in Kosovo are high, policymakers need to provide opportunities to reverse such a trend by formulating sound environmental development policies while working to reduce current pollution. Some of the main sources of pollution are coal-based electricity generation, extraction, and production of non-ferrous metals and the chemical industry. The light industry also contributes to pollution, including the production of textiles, leather, rubber, paper, and building materials. (Blaku, 2005, p. 34). To be correct with the nature of the work and the treatment of the topic that we have for competent treatment we have offered a wide scientific and professional color as a focus of smelling scientific nectar we have oriented to professionals who know and are sympathetic to the daily work in the field of the energy economy. We targeted 25 respondents as economists, technologists, hydrologists, university professors, ecologists, geologists, and non-governmental organizations. The readiness and variety of the answers of the respondents give the firm to the work and research, being somewhat relieved by prejudices, by narrow interests to the detriment of the social interest. It is a fact that the Republic of Kosovo has underground resources but the economic dynamics do not give us the comfort to exalt ourselves while we are ranked among the underdeveloped countries this makes us open the way to electricity production in ways and methods which are easier and more economical. Availability of respondents that in addition to the development of conventional energy we have available (coal) but giving priority to the production of alternative energies as a need of the time. From the answers, we have these results where from economists two claim alternative energy, one denies it and two leave it to time for alternative energy. Technologists claim and leave time for switching to alternative energy as well as hydrologists, just as technologists claim and leave time, also university professors claim and leave time. Specialized businesses claim 100% being willing to invest in alternative energy, ecologists claim 100% in favor of transforming electricity generation, while geologists deny transforming electricity generation, the same stated by technologists, while ecologists affirm the transition. Practical scientific resources and research provide us with an insight that in addition to the use of conventional energy or coal at the same time, we must be in step with time thinking about new alternatives in the production of electricity.

Table 1. The Transition from conventional energy to alternative energy

Nr	No. of participants	Profession	Claim	Deny	Time factor
1	5	Economist	2	1	2
2	2	Technologist	1	0	1
3	3	Hydrologist	1	0	2
4	6	University Professor	5	0	1
5	3	Specialized businesses	3	0	0
6	1	Ecologist	1	0	0
7	1	Geologist		1	
8	4	Non-governmental organizations	0	0	4
	25		13	2	10

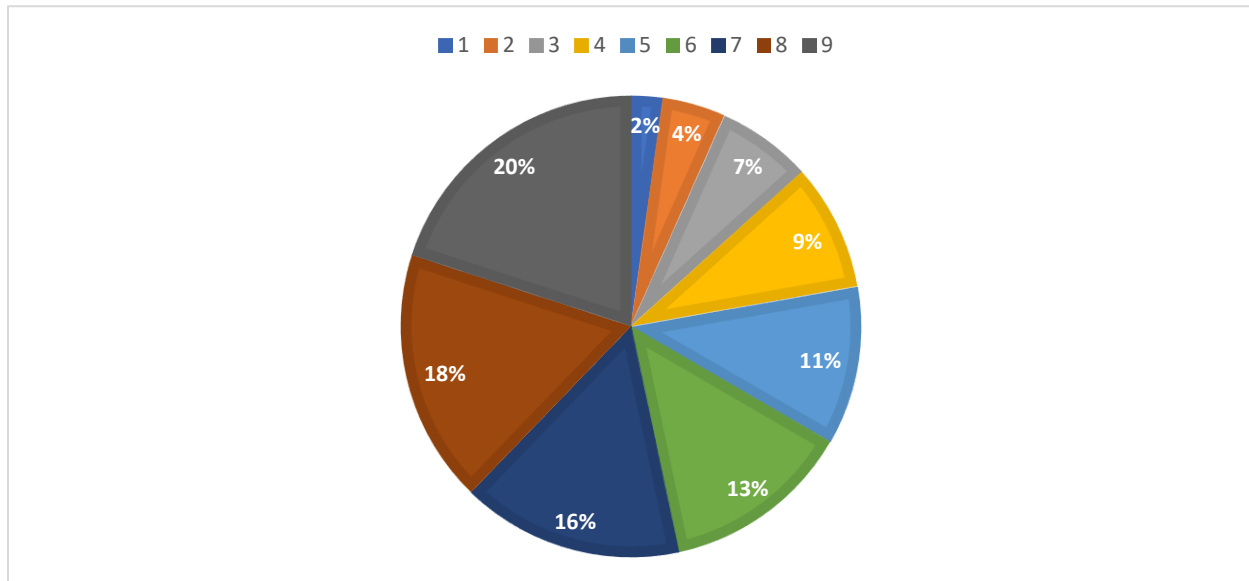


Figure.1. The Transition from conventional energy to alternative energy

Conclusions and recommendations

Renewable energies already constitute the main direction of the development of energy sources all over the world. Rapid growth, especially in the energy production sector, is driven by many factors, including cost reductions, support policies, improving financial opportunities, energy supply risks and environmental problems, increasing energy demand in developing economies, and the need for a presence in contemporary energy sources. New markets are constantly emerging in all regions, both for concentrated renewable energy sources and distributed ones. Intensive efforts are being made all over the world to provide alternative energy sources, to meet the ever-increasing needs of society. Fossil resources (oil, coal, natural gas) have become very scarce and cannot afford not only the growth of the population but also the demands of modernity and continuity of life on our planet. It is a known fact that the highest amount of energy which is consumed in Europe has fossil origins, but the environmental impact of their combustion is high in the energy sector, of course, Kosovo is the same in terms of fossil-based electricity production.

Recommendations:

The essence of any research is the recommendations that, of course, based on scientific data and practices, we can recommend:

- Rigorous implementation of laws for the protection of natural resources,
- Strict control for protection from industrial pollution with special emphasis on electricity.
- Encouraging scientific research and incorporating new technologies during energy production to protect the environment.
- Adherence to the spatial plan in Kosovo by European standards.
- Utilization of alternative energies such as solar energy, hydropower, thermal water, and bio-energy.
- Application of modern methods of industrial and urban waste treatment, including recycling.
- Participation and involvement in all regional initiatives and beyond to protect the environment.

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