

# Strategies in the energy's field in Kosovo

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## **ABSTRACT:**

This paper treats some problems connected to the strategies used in the energy's field in the Republic of Kosovo. It shows how attempts have been made to conduct research, analytical and theoretical analysis in the field of management of various operations in the field of energy, based on innovations to provide a clear picture of the application of new technologies and innovations such as contemporary trends in the country, the region and beyond as a necessity of the future. *After a detailed assessment of the current energy situation in Kosovo, taking into account energy and its resources with energy consumption in general, the application of innovations to increase energy management efficiency, is read respectively their impact on improving the quality of energy services.* In this paper an assessment of the current energy situation has been made, taking into account energy and its sources as well as energy consumption in general.

The application of innovations, good energy management and the changes that follow after the application of the above measures, respectively, their impact on improving the quality of energy services, combined with the use of renewable resources significantly leads to reduced electricity costs and dust emissions.

**Keywords:** *IT innovations in the field of energy, Energy Management, Energy Audit, Tracking total energy consumption, Energy Management Software, Real Time Energy Management*

## **1. Introduction**

We must see innovation as an ongoing process to improve skills, knowledge and results in terms of the process of improving products and their development in general as well as energy in particular. Key issues remain the identification of problems in practice, the generation of creative ideas for problem solving, the development of an effective approach to the implementation of ideas, the reasoning of the innovative potential to generate solutions. The grouping of innovations is divided into the form of innovation and the degree of innovation. Forms of innovation are addressed in contemporary groupings that include innovations in services and innovations in work organization. More specifically, our target has been the assessment of the current energy situation in the Republic of Kosovo, taking into account energy as a product, its sources as well as energy consumption in general, analyzing the current cost of electricity without applying strategies that improve efficiency and energy management and the changes that follow after the

application of these strategies that lead to taking measures that will affect the improvement of the quality of energy services as a whole.

In this study, attempts have been made to conduct research, analytical and theoretical analysis in the field of management of various operations in the field of energy, based on innovations to provide a clear picture of the application of new technologies and innovations such as contemporary trends in the country, the region and beyond as a necessity of the future.

New technologies are considered almost mandatory in developing countries, especially those in the EU, and especially for all those countries that consider that consumption reductions are achieved through innovations and innovations in all indicative areas for the development of the nation and the preservation of the environment in general such as ecology, the performance of buildings in compliance with the mandatory directives from the frameworks of European legislation.

The theoretical overview focuses on the elements chosen for energy analysis, in the design and development of innovations, technologies, service products and energy management. All of these as a whole are analyzed from a theoretical point of view first and then from a practical one through primary and secondary case studies, causing recommendations for improvement or change of any of these aspects.

*However, in-depth analyzes of strategies built by years are reflected, starting from 2003, 2009, 2018, 2026 (MEZH, 2018; TSO, 2017), related to the management of operations according to their specifics. Based on the use of advanced field literature, examples have been taken from our experience and*

*that of others to build recommendations and clarify current positions in the field of energy efficiency.*

*After a detailed assessment of the current energy situation in Kosovo, taking into account energy and its resources with energy consumption in general, the application of innovations to increase energy management efficiency, is "read" respectively their impact on improving the quality of energy services (GIZ, 2019).*

*In addition to addressing new technologies in increasing electricity efficiency, it is clear that the use of renewable energy sources will significantly reduce electricity costs and dust emissions will be reduced by more than 90%, those of SO<sub>x</sub> and NO<sub>x</sub> by about 70% and there will be no increase in carbon dioxide emissions per unit of electricity produced (GIZ, 2019).*

How do IT innovations affect the reduction of energy consumption - by applying electricity efficiency measures? The main argument is the challenges of Kosovo in the energy sector and IT innovations in this area because for the production of electricity Kosovo relies on power plants with lignite combustion mainly. The development of a database on energy consumption in public institutions, the household sector, the industry sector, the services sector and the transport sector, would enable us to identify energy consumption's figures and establish a monitoring process in order to cost-effective energy efficiency measures are planned and implemented (MEZH, 2012; Vokrri, et al., 2017).

## **2. Literature review**

People and businesses have always strived to provide as many resources as possible that enhance their well-being. Even today this interest is not less due to the high demand for resources. So companies are constantly subject to competition and can afford it if they can use these resources carefully. Therefore, for these companies there is always the concern "how to have more technological know-how than others" and that the real competitive advantage of the company is the ability of its people to learn quickly. From this concept, today it is more than logical the appearance on stage of "knowledge enterprises". So we have a pressure of competition between companies, then technological developments, globalization of the economy have made companies more committed to providing a resource - knowledge which is now in the strategy of increasing efficiency for all economic entities (Johnson, et al., 2008; Martinich, 2001).

Knowledge - knowing or controlling processes, is known as the generator of change, our future is in our heads and in our hands. Innovative companies manage innovative managers who have knowledge and know how to motivate their employees.

Many authors attribute knowledge to the attribute of the enterprise asset, it is considered an asset and this asset is sacred, it is an asset that enables companies to have a good competitive position and provides them with development.

Steven Goldman since 1995, describes the strategic dimensions of the organization's behavior, focused on two points:

- Change management and elimination of uncertainty;
- Creating a connection between people (entrepreneurial culture) and knowledge (intellectual capital).

According to Drucker (1993) and Weggeman (1997) there are three stages that society has gone through to reach the knowledge economy:

- The first - the industrial revolution (1750-1880), during which companies used knowledge to produce tools and equipment for production;
- The second - the revolution in production (1880-1945), during which knowledge was used to improve work processes;
- The Third one - represents the last stage of major developments in the process of corporate governance (1945- to date), during which companies have used the knowledge to increase as much as possible the level of knowledge of the employed at work.

"If the competition can be from any corner of the world then businesses are increasingly trying to be special, to be different from others. The uniqueness does not come from tangible tools and equipment, but from knowledge, creativity, specialization, and the uniqueness of the way of doing business and presenting to consumers and competitors products that should be cheaper and more usable, which are characterized by "brand-ing"(Andriessen, 2004).

Innovations generally support the hope of a dynamic future of new trends, which flow and result in many rapid changes, in general.

Economic benefits from the application of new technologies and IT innovations in energy in the Republic of Kosovo, are also the result of work related to detailed study and preparation according to the trends of the time and coordination between them within the so-called Energy strategy (MEZH, 2018) and where it consists of:

- Legal framework in the energy sector, in accordance with EU directives;
- Strategic framework;
- Strategic documents which reflect the increase of Energy Efficiency in the Energy Sector in the Republic of Kosovo;
- Projects in the implementation of EE measures in Public buildings;
- e-Cooperation under the Energy Community Treaty (ECT);

### **2.1. The path to success**

With the energy independence achieved by Kosovo, it is possible that with the approval of EU member states, energy benefits to be considered reciprocal with Albania, reciprocity which means export / import at the time of summer and winter season (Kosovo will be able to import energy during the summer in Albania due to drought and lack of rainfall and winter season, Albania will be able to import energy in Kosovo because from HPP there will be sufficient production for import);

But still for the full implementation of this reciprocity, the following must be done:

- Completion of the legal basis (establishment of the Fund for Energy Efficiency),
- Institutional capacity building of the public & private sector (at municipal level) for the implementation of the National Plan for EE,
- Expansion of schemes and opportunities for financing and implementation of EE measures,
- Further improve the system of energy statistics and establish an adequate system for monitoring and evaluating the improvement of energy efficiency,
- Continuation of the public information campaign on energy efficiency,
- Establishment of municipal energy offices,
- Compilation of Municipal Energy Efficiency Plans approved by the Municipal Assembly and sent to KEEA,
- Assisting Municipalities in preparing municipal EE plans and reporting on their implementation,
- Creation of Energy Efficiency database (software),

New technologies are considered almost mandatory in all EU countries and especially for all those countries that consider that consumption reductions are achieved through innovations in all indicative areas for the development of the nation and the preservation of the environment in general - ecology , building performance, mandatory directives, etc.

In this paper an assessment of the current energy situation has been made, taking into account energy and its sources as well as energy consumption



in general. The application of innovations, good energy management and the changes that follow after the application of the above measures, respectively, their impact on improving the quality of energy services, combined with the use of renewable resources significantly leads to reduced electricity costs and dust emissions will be reduced by more than 90%, those of SO<sub>x</sub> and NO<sub>x</sub> by about 70% and there will be no increase in carbon dioxide emissions per unit of electricity produced (GIZ, 2019).

### **3. Methodology**

The collection of data for the evaluation of this project was done through two methods:

- research of primary and secondary data
- interviews.

Regarding secondary data, sufficient and very productive material has been collected from Government Institutions, non-governmental organizations, KEK, the World Bank, etc.

The results of the presented study are based on the research with survey of consumption of the service sector (public institutions) and households according to these categories: A) -for space heating, B) -for heating of sanitary water, C) -for cooking , D) -for non-thermal use (Kosovo Agency of Statistics, 2017).

The Ministry of Economic Development, as the main responsible for energy, has the basic goal of ensuring a sustainable and secure energy supply for all consumers, taking into account the preservation of the environment and the efficient use of energy (Gashi, 2013).

Interconnection with Albania is a key problem for raising the level of security of electricity supply to a higher level, while electricity generation capacities are outdated and with low reliability of production security. The penetration of renewable energy technologies is very difficult in Kosovo, although the MED, respectively the Energy Efficiency Agency, make maximum efforts to stabilize the situation. The system for monitoring the implementation of legislation, as well as that of the implementation of government policies and programs is not yet effective. Without an efficient monitoring system we can not claim for effective monitoring of power supply security (Grainger & Stevenson, 1994).

Liberalization of the electricity market is also a serious challenge that requires preconditions related to the necessary modernization in the entire infrastructure of the power system, while the requirements of the ECT to the states that are contracting parties are already time-bound for the complete liberalization of the electricity market. All that was said above presents a not so enthusiastic picture in terms of the preconditions for guaranteeing a secure energy supply. However, to take advantage of these opportunities in the energy sector, Kosovo needs a further improvement of the existing institutional and legal framework, while improvement has been made with the establishment of the Ministry of Energy and Mining, the Energy Regulatory Office and the Independent Commission for Mines/Minerals.



Figure 1: TPP Kosova B (digital monitoring of equipmentS)



Regarding to the Energy consumption problem in Kosovo, a following SWOT analysis is done:

- Strengths

Investments for the revival of the energy sector - attracting domestic and foreign investors. By applying innovations and efficient measures, energy consumption costs will be reduced in all sectors (Weedy, et al., 2012).

- Weaknesses

Lack of knowledge on the application of innovation measures and efficiency - awareness of the human factor in Kosovo and insufficient funds from Government Institutions for investments in renewable sources of alternative energies.

- Opportunities

Employment of alternative sources of renewable energy. The stock of buildings in public and private services, in the household includes the largest contribution of energy saving (40% + 30% = 70%) therefore the action plan 2019-2021 foresees the focus on the building sector of Kosovo.

- Threats

Currently 97% of energy is obtained from TPPs of Kosovo A and B, ie 3% are from HPPs, therefore environmental pollution is considered as one of the negative factors for Kosovo, not forgetting the impact on global warming and the construction of a new TPP with lignite fuel.

Through SWOT, four factors will be analyzed in general. Large investments are needed to revive the energy and mining sector and in this regard direct foreign investment is crucial.

#### **4. Results**

Approximately 98% of the energy produced in Kosovo is provided by two carbon-fired power plants with lignite (TC), "Kosovo A & B" (GIZ, 2019). These power plants are owned and operated by the Kosovo Energy Corporation (KEK): Kosovo's vertically integrated energy enterprise is responsible for coal mining, generation, distribution and supply.

TPP Kosova A consists of five units (A1-A5), with a total installed capacity of 800 MW, although units A1 and A2 are no longer operational and are considered unsuitable for further commissioning.

TPP Kosova B consists of two larger units (B1 and B2) with an installed capacity of 678 MW.

During 2018 in TPP Kosova A are produced about 2.3 million MWh of electricity. During 2018 in TPP Kosova B are produced about 3.4 million MWh. Total from Kosovo A and B during 2018 were produced 5.7 million MWh of electricity. Thermal energy is produced 450 thousand MWh for population heating purpose (MEZH, 2018).

Hydropower plants (HPPs) account for the remaining 2.2% of Kosovo's net electricity generation. HPP Ujmanit is managed by the public enterprise Ibër-Lipenci.

The remaining small hydropower plants (all owned by private investors) are connected to different locations in Kosovo's distribution network. In total, these small HPPs have approximately a net output of 42 GWh (capacity factor ~ 48%).

KOSTT sh. manages and operates the electricity transmission system of Kosovo and is responsible for the transmission of most of the electricity in high voltage electricity networks (TSO, 2017).

## 5. Conclusions

*Energy saving in the process of energy production and transformation is also a function of innovations and strategies' interweaving that must be applied in accordance with the relevant objectives and targets, including the energy distribution network, reduction of transmission and distribution losses, improving the efficiency of power plants, increasing the energy component produced by high-efficiency cogeneration.*

*Prior to making strategic economic development decisions, the national potentials in security of supply for a sustainable development should be assessed. Innovation and Electricity Efficiency are an important tool for achieving a reduction in greenhouse gas emissions, so that consumers would reduce their energy bills and demand in general would be reduced.*

*It is clear that increasing the share of energy from renewable sources and the application of innovations are important for Kosovo in terms of diversification of energy sources and almost complete dependence on generating capacities with lignite combustion.*

*The construction of the Kosova e Re power plant and the construction of hydropower plants (in line with the opportunities offered by Kosovo) will be a good solution for Kosovo in terms of energy supply.*

*Energy saving in the process of energy production and transformation, energy prospects and independence and application of Innovations in accordance with the strategies to be applied and objectives, relevant targets including energy distribution network, reduction of transmission and distribution losses, improving efficiency power plant power.*

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