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# IMPACT OF THE ENERGY SECTOR IN THE KOSOVO'S POPULATION HEALTH

RUZHDI SEFA[(a)], ADMIR SHALA[(b)]
(a) Faculty of Electrical & Com. Engineering, University of Prishtina, ruzhdi.sefa@uni-pr.edu
(b) Faculty of Engineering, Dublin Institute of Technology, admir.shala@hotmail.com

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**PERMBLEDHJE**
Punimi analizon kontributin e ndotjeve nga sektori i energjisë në zhvillimin social dhe mjedisor të Kosovës duke krahasuar me shtetet relativisht të vogla anëtare të BE-së si Irlanda, Sllovenia dhe Estonia. Me anë të indikatorëve të Energjisë për Zhvillim të Qëndrueshëm, i hartuar nga OKB, Agjencia Ndërkombëtare e Energjisë, Agjencia Evropiane për mbrojtjen e mjedisit, etj vënen në dukje dallimet e zhvillimit social dhe mjedisor në Kosovë me ato në vendet e përzgjedhura. Analizat janë kryer duke përdorur metodologjinë e krahasimit. Punimi ofron të dhënat statistikore të institucioneve ndërkombëtare dhe kombëtare gjatë periudhave të caktuara dhe trendet përkatëse. Kjo përfshinë ndotjen e mjedisit si parametër që ndikon në shëndetin e popullsisë, rritjen e emisioneve $CO_2$ dhe shkallën e shpyllëzimit nga përdorimi i biomasës si burim i energjisë.
**Fjalët çelës:** Mjedisi, shëndeti, ndotja, dioksid- karboni, treguesit.

**SUMMARY**
The topic analyses the contribution of the pollutions which results from the energy sector on social and environmental development of Kosovo by comparison with the European Union's relatively small member states such as Ireland, Slovenia and Estonia. Through the Energy Indicators for Sustainable Development as an analytical tool designed by the United Nations, International Energy Agency, European Agency for environmental protection etc. are pointed out and analysed the differences and characteristics of social and environmental development in Kosovo with those in the selected states. The analyses are accomplished by using the methodology of comparison. The theme provides the statistical data of various international and national institutions during certain times of recent years and respective trends. This includes the environmental pollution as a parameter which affects the health of population, increase carbon dioxide emissions and deforestation rate that results due to the use of biomass as a source of energy.
**Keywords:** Environment, health, population, carbondioxide, indicators.

## 1 INTRODUCTION

Countries which have not yet established sustainable energy sectors should learn from the experience of others in order to identify the appropriate programmes and ensuring health protection of population.[1]

According to the booklet about the link between energy and health prepared by London Health Commission and published on August 2003, energy services typically play a positive role in promoting health whereas the generation of energy tends to have negative health impacts. The goal of a healthy energy policy should be to maximise the benefits of energy services while minimising the negative impacts of energy generation.[2] Is obviously clear that there are various negative impacts and this study will be focused on the few aspects that are more critical for Kosovo and hence in this view the question that arises is: What are the main contributors of energy sources that affect the Kosovo's population health?

## 2 BACKGROUND

The armed conflict over the entire region left behind a damaged energy system infrastructure. Despite substantial external subsidies from the international community and the best intentions of Kosovo's people, reconstruction and development has been slow. The policy makers' efforts to improve life conditions and develop the energy sector are most likely to face a difficult road ahead in terms of increasing the electricity supply without affecting the social and environmental development which affects population's health in the country. At present, Kosovo is facing a protracted energy crisis and the government is forced to allocate funds to cover the cost for imported energy, especially during the winter.[3]

## 3 CROSs-Country COmparison Analysis

The concept to complete this paper will be confined to theoretical part followed by comparison of the respective elements of energy sectors in developed countries. Using the research methodology of comparison by other countries, it shall yield an insight for the main distinctions. Methods such as description, classification and analysis of data will be used in generating an overall view about the research objective. The key differences between selected states and Kosovo will be highlighted through Energy Indicators and Statistical Data.

### *3.1 Selection of Countries for comparison*

During the presentation of the findings for Kosovo energy sector the study pays attention to the situation in other relevant countries. Amongst these states identified are Ireland, Slovenia and Estonia (hereinafter referred to as EU-3 Member States), which comprise the pattern chosen for the comparison with Kosovo. They are relatively small countries, and were part of larger political and economic systems until last century and they are regarded as success stories in integrating into the EU.

### *3.2 Energy Indicators*

The energy as an issue has received greater attention since the Rio de Janeiro Conference in 1992 on Environment and Development when the international community acknowledged that access to modern energy services for all is necessary to achieve sustainable development, and hence asked for compilation of energy indicators in accordance with Agenda 21 for joint actions. Such cooperation among key stakeholders culminated with publication of a set of energy indicators in 2005 that are testified as valuable analytical tools.[4]

## 4 Key Differences Between Kosovo and Eu-3 Member states

### *4.1 Use of biomass in Kosovo*

Traditionally due to the lack of gas network in Kosovo, its population in general has relied in the biomass sources for heating and cooking. The smoke from the combustion in the opened and closed stoves that results with indoor air pollution occurs as a problem that can travel hundreds of kilometres and hence cause a negative impact on the environment and human health at the same time. According to surveys conducted by Ministry of Energy and Mining (MEM) for the purposes of Kosovo's Energy Balances for the year 2009, consumption of traditional fire wood (non-commercial energy) reaches 57% of the total used energy in the household sector.[5]

*Globally, one person in five still lacks access to modern electricity and twice that number – rely on wood …for cooking and heating. Mr. Ban Ki-moon said in remarks to the opening of the World Future Energy Summit, which is held in Abu Dhabi, United Arab Emirate on January 2012* [6]

Comparing the statement above and the findings from the MEM surveys, in Kosovo, around three persons in five rely on fire wood energy to accomplish their household needs.

According to public data [7], [8], [9] and their compilation based on the methodology of empirical (Tab.1) is build a diagram, presented in the figure 1, which shows that Kosovo has the

highest rate of percentage in Europe about the use of traditional solid fuels i.e. wood or coal.

| Year 2003 or latest available | Percentage of population using traditional biomasses |
|---|---|
| Kosovo | 89.00 |
| EU-27 | 6.80 |
| Ireland | 5.00 |
| Slovenia | 8.00 |
| Estonia | 15.00 |

***Tab 1*** *Rate of percentage in Europe using traditional solid fuels*

Although the compilation of this indicator for Kosovo comprises of data from different sources and different time periods, for comparison purposes it could be taken as accurate, since possible changes in the relationship between urban / rural do not affect the overall.

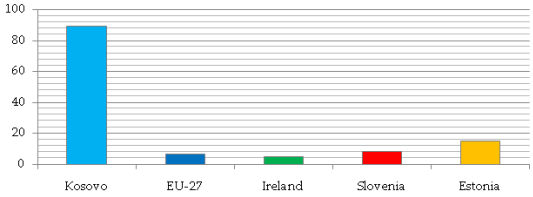


***Fig 1*** *Share of population dependent on non-commercial energy*

High levels of indoor air pollution results from burning of biomasses and as more time people spend in these environments the more health consequences for human health are. Studies of the World Health Organization (WHO) revealed that indoor air pollution from burning fuel wood is one of the top ten global health risks. Burning of fire wood, contributes to various diseases such as children's pneumonia, respiratory problems, lung cancer, tuberculosis, asthma etc. The most affected are usually women and children, because they are largely exposed for longer periods to such environments.[7]

In Kosovo's society, especially in rural areas, women are in charge of cooking and taking care of kids. Bearing this in mind and the fact that Kosovars have a very young population in contrast to the rest of Europe it can have long-term consequences in social development and in the concrete case, the health

### *4.2 Environmental Pollutants*

Centre for Energy, Environment and Health (CEEH) in Denmark has concluded in November 2011that some of pollutants that result direct from the generation of coal lignite combustion have negative impact for human health. The effects of these pollutants, especially particles smaller than 10 microns such as $CO_2$, $SO_2$, $NO_x$ and dust increases deaths, respiratory problems and cardiovascular disease. Power stations produce plumes of air pollutants which are then dispersed across a wide geographical area and the population living around that will be affected by raised levels of pollution.[10]

In Kosovo the largest air-polluting source is the coal-burned power plant in Obiliq. Air pollutants such as mentioned above are emitted from the plant and contribute significantly to the bad air-quality in Pristina and the surroundings (700.000 people live in an area of influence of the two lignite power plants). Road transport is another major source of air pollution. Dust in the cities from increased traffic and old vehicles are other concerns.[11]

A study on the Potential for combating Climate Change in Power Generation in the Energy Community conducted during 2009 and finalized on 31 March 2011, presents an inventory of the Greenhouse gases (GHG) from electricity generation. As regards the thermal power plants units in the region, the average weighted operation time, by the end of 2010, was 30 years and in bad condition, due to lack of maintenance and investment over the last two decades. In Kosovo, there are some units of thermal power plants that entered into operation around forty five years ago and they are main pollutants of the environment which affect quality of life for people living near and present an active threat for their health.[12]

As stated above, huge amount of energy used in Kosovo is consumed by the household sector for the purpose of heating, therefore it also accounts for a significant share of the $CO_2$ emissions, mainly through the large combustion of fossil fuels used for individual heating in the furnaces and from District Heating utilities.[13]

Aiming to have similar reflection same as other selected countries (using data from the Balances sheet of Government of Kosovo [5], IEA [14] and Report of IEA about Energy in Western Balkan [15]) we achieve to found out parameters for Kosovo and by compounding these data (Tab.2) is build diagram presented in the figure 2 where are presented trends of $CO_2$ emission per capita. Such trends are obviously a big challenge for the future of Kosovo population.

| | (t $CO_2$/capita) | | |
|---|---|---|---|
| Country | 2005 | 2009 | Difference in % |
| Kosovo | 2.53 | 5.25 | 107.51 |
| EU-27 | 8.63 | 7.15 | -17.15 |
| Ireland | 10.40 | 8.83 | -15.10 |
| Slovenia | 7.90 | 7.43 | -5.95 |
| Estonia | 13.00 | 10.94 | -15.85 |

***Tab 2*** *Trends of carbon dioxide emission per capita in EU Member States and in Kosovo*

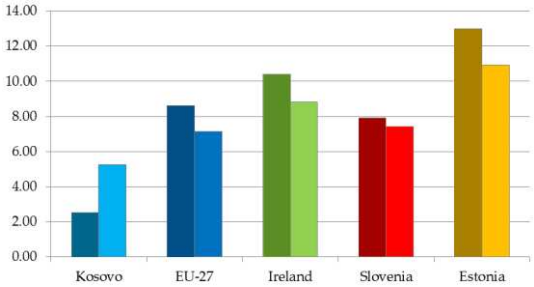


***Fig 2*** *Comparate of carbon dioxide emissions between years 2005 – 2009*

### *4.3 Deforestation*

As stated in the Policy and Strategy Paper on Forestry Sector Development in Kosovo, 2010 – 2020, the forest industry impacts on Kosovo socially and economically due to the fact that especially in rural areas a considerable portion of the population receives its livelihood through forest operations. Due to the importance of the information for various needs, during the years 2003-04, a country-wide forest inventory was conducted. This revealed that 40% of public forestlands and 29% of private forestlands have been subject to the massive harvesting activities.[16] High rate of fires during the summer season and the destruction of forest areas in the absence of protective measures and appropriate tools against forest fires also increase the rate of deforestation in Kosovo. Among measurements methods for the total rate of deforestation (TRD) attributed to usage of fuel wood for energy purposes tracked over time, is also the comparison of forest area at two different times using as reference years. The rate of deforestation attributed the use of fuel wood ($RD_{fw}$) is determined as the ratio of the average annual fuel wood production (FWP) to the annual total forest felling (TFF). The TRD is the compound annual rate in percentage from year (p) to year (n).[4]

$$\mathbf{TRD} = 100 * \left(1 - \left(\frac{FOREST\ AREA\ n}{FOREST\ AREA\ p}\right)^{\left(\frac{1}{n-p}\right)}\right)$$

Therefore, following these instructions for the estimation [17], [18], below are deforestation rates of areas in the respective states, which confirm the previous warnings of IEA and UNDP about the critical situation in Kosovo's forestry (Tab.3). As result we face with the truth that Kosovo's forestry has deforestation of 2% annually.(Fig. 3)

| | Forest area (sq. km) | | Percentage of RDfw: |
|---|---|---|---|
| Country | 2005 | 2009 | TRD × (FWP/TFF) |
| Kosovo | N/A | 4648 | -2.00 |
| EU-27 | 1543420 | 1568650 | 0.33 |
| Ireland | 6950 | 7390 | 1.18 |
| Slovenia | 12430 | 12530 | 0.13 |
| Estonia | 22520 | 22170 | -0.27 |

***Tab 3*** *Forestation rates of areas in the respective states*

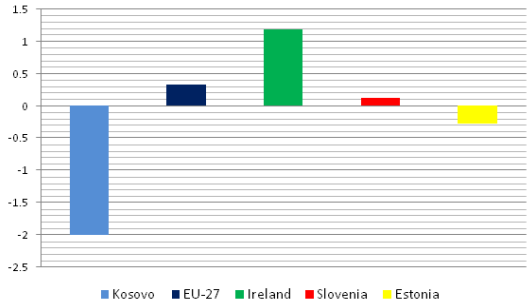


**Fig 3** Rate of forestation between years 2005 –09

According to World Wildlife Fund (WWF), Environmental degradation is causing serious

detrimental health impacts for humans. "Deforestation is a double blow to human health," says Chris Elliot, WWF's Executive Director of Conservation. Protecting natural landscapes can contribute positively to human health through protecting future medicinal resources, reducing the impacts of pollution, toxins and weather extremes and providing recreational places that support physical and mental well-being.[19]

Kosovo forestry covers around 40% of its surface, thus if the current trends continues undoubtedly it will have negative consequences for the population in Kosovo and beyond.

**Conclusion**

The so far general perception about 'cheap' energy from biomass and coal shall fall in the future due to the recent results published by different worldwide research institutions about the negative impact from these sources on the health of population.

According the Harvard University analysis, each stage in the life cycle of coal-extraction, transport, processing, and combustion—generates a waste stream and carries multiple hazards for health and the environment. These costs are external to the coal industry and are thus often considered "externalities". Many of these so-called externalities are, moreover, cumulative.[20] The external cost of electricity generation is borne by the population of Kosovo, and not paid by the lignite fire power plant! In other words, the population's health is not at the forefront of policy makers' concerns. The latest plans for installation of new huge capacities of lignite power plant and deforestation in Kosovo during the recent years accompanied by the negligence of authorities about this matter only confirm it. Outputs presented in this study show that although CO2 Emission per Capita in Kosovo compared with EU Countries and EU-3 Member States are lower however there is no room for complacency because this is a result of low energy intensity due to the lack of industry.

But there is an enormous increment for more than double of $CO_2$ emission between the years 2005 - 2009, while in the same period in EU countries and EU-3 Member States is recorded a decrease as result of measures undertaken due to the commitments undertaken as result of Koyto protocols by respective governments. Therefore we conclude that the situation is highly critical for the Kosovo's population health, which in the future can be accompanied with additional statistical data from the Health Information System. Anyway according to the analysis presented in this paper all aspects above should be an alarm for Kosovo.

**REFERENCES**

[1] World Energy Council, Assessment of country energy and climate policy,2010
[2] London Health Commiss. Energy HealthAug.03
[3] UNDP, Energy for Development, Kosovo 2007
[4]Energy Indicators for Sustainable Development Guidelines and Methodologies,2005
[5] GoK – MED, Republic of Kosovo's Energy Balance for the year 2009
[6] UN News Centre, 16 January 2012
[7]http://www.who.int/indoorair/publications/fuelforlife.pdf
[8] http://esk.rks-gov.net/rekos2011/?cid=2,1
[9]http://www.kosovo.undp.org/repository/docs/KHDR_eng_opt.pdf
[10] CEEH Scientific Report No.7a,November2011
[11] University of Gothenburg, Kosovo Environ. and Climate Analysis, March 2005
[12] Study on the Potential for Climate Change Combating in Power Generation,2011
[13] GoK – MED, Republic of Kosovo Heating Strategy 2011 – 2018
[14] IEA, Balance Sheet,2012
[15] IEA, Energy in the Eastern Balkan, 2008
[16] GoK – MAFRD, Policy and Strategy paper on forestry sector development, 2010 – 2020
[17]http://data.worldbank.org/indicator/AG.LND.FRST.K2
[18]http://www.unece.org/fileadmin/DAM/timber/statsdata/fps05-09.pdf#page=9
[19] World Wildlife Fund, Human health linked directly to forest health, 2010
[20] Harvard University, Full cost accounting for the life cycle of coal,2011.