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OPPORTUNITIES FOR YOUNG PEOPLE IN TIMES OF CLIMATE CHANGE AND ENERGY TRANSITION

IMPRESSUM

Title:

Opportunities for young people in times of climate change and energy transition

Publisher:

Konrad-Adenauer-Stiftung, Macedonia

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Coordination and final editing: Daniela Popovska, Konrad-Adenauer-Stiftung, Macedonia

Design and print:

Vinsent Grafika

Circulation:

300 samples You can download the publication free of charge at: http://www.kas.de/mazedonien/en/publications/ http://www.gogreen.mk/

Note:

The views expressed in this publication are the authors' personal points of view and they do not necessarily represent the positions of the Konrad-Adenauer-Stiftung.

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April, 2015

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INTRODUCTION

Dear readers,

The climate change policy and the overall question of sustainable development are no doubt issues that demand international approach. They should be seen as a global challenge and should be treated with inclusion of, and in cooperation with, all the countries and regions in the world. They are not subject to just one national policy, no matter whether it is a country of the EU, one of the developing countries, country in a transition etc. – no matter on which continent they are situated or what political background they have. The question of climate change and energy is a question of security, migration, distribution of resources and a global economic issue. Moreover, in order to approach these questions adequately global policies and strategies should be developed.

As a political foundation the Konrad-Adenauer-Stiftung is strongly dedicated to supporting projects on sustainable development worldwide. Since 2010 we have actively supported projects in this field in Macedonia as well. Our aim is to intensify debates on issues related to the environment, climate change and energy policy, as well as to enhance exchange of experiences and knowledge between Germany and Macedonia but also among the countries in the region.

In this manner we strongly support the inclusion of young people in projects of this kind, since we believe that the young generation should play a central role in bringing fresh ideas at all stages of sustainable development: from community businesses to policy making.

The environmental NGO Go Green and Konrad-Adenauer-Stiftung have been partners since 2013, working mainly on the issues of climate change and energy. Each year we organize the marking of the *UN World Environment Day* on the 5th June and the *EU Sustainable Energy Week*, with the aim of raising awareness among the general population and mobilization of young people to take actions for environmental protection in their local communities.

As part of our cooperation we have organized workshops and panel discussions with Mayors and municipality representatives, Ministers and Ambassadors, Members of the Parliament and other relevant

institutions, with the aim to lobby and influence policies for sustainable energy and climate-friendly economy. At the same time we have jointly published several publications tackling issues on energy savings through recycling, opportunities for young people in times of climate change and energy transition etc.

A recent area of cooperation is the "Youth employment in clean energy sector" where besides lobbying and advocacy for improvement of policies, we organize events such as the *Clean Energy Fair*, where young people meet with universities and companies that provide opportunities related to renewable energy and energy efficiency. The publication "*Opportunities for young people in times of climate change and energy transition*" is also a part of this initiative for inspiring and engaging young people to study and work in the area. On this occasion we would like to thank both teams for their dedication to this project, especially our co-workers from Go Green, as well as Daniela Popovska from the Konrad-Adenauer-Stiftung, who gave their precious input in the outlining and realisation of this publication.

With our joint activities we have reached more than 1.000 young people and over 50 municipalities. Our cooperation has proven that the combination of enthusiasm and creative ideas, as well as committed and trustworthy partners, is the recipe for success and positive impact in the society.

We are looking forward to our future projects and cooperation together and we wish you a pleasant and interesting reading.

Sincerely,

Johannes D. Rey Konrad-Adenauer-Stiftung in Macedonia **Antonio Jovanovski** Go Green Skopje

METHODOLOGY

This paper was developed through a desktop research of the available literature on the topic. On-line survey was prepared to evaluate the opinion and knowledge of young people where certain conclusions were formed. Further information was obtained via discussions and contributions from CSO partners from the countries subject to this paper. This study is not a scientific report, but rather should be intended as providing an overview of the situation for policy-makers, opinion-leaders, civil society and other non-specialists, to be used to stimulate a dialogue about the best ways to tackle climate change and create opportunities for new energy talents to emerge and accelerate the energy transition towards low-carbon economy. Wherever possible, links have been provided to documents or institutes where further information may be found.

SUMMARY

Climate change poses a severe threat to the future sustainable development of our societies. The transition to low-emission development in both developed and developing economies has been recognized internationally imperative to the stabilization of greenhouse gas (GHG) concentration in line with a 2 degree Celsius temperature increase scenario. Reaching emission reduction requires energy transition from fossil fuel to renewable energy sources. Cutting carbon emissions from economic growth in all sectors will cause disruptions in established industries and threaten existing jobs. On the other hand, climate change mitigation and adaptation measures will create new jobs in both existing and new sectors of society. Due to the rapid growth of the renewable energy and energy efficiency sector there is a skills shortage, and a lack of gualified people in order to continue its development. The European industry leads the global renewable energy technology development and employs 1.5 million people and by 2020 could employ a further 3 million¹. Effective energy efficiency measures could create or retain around 2 million green jobs in Europe².

On the other hand, more than 5 million young people aged 15-24 are unemployed in the EU today.³ The role of young people in the energy

 $^{^{1}}$ European commission, 2011, Renewable Energy: progressing towards the 2020 target.

 $^{^2}$ European commission, 2011, Impact assessment accompanying the Energy Efficiency Plan.

³ Addressing youth unemployment in the EU, January 2015.

transition, climate change adaptation and mitigation strategy is of utmost importance. The EU has established mechanisms for financing initiatives and encouraging the engagement of young people, such as the youth guarantee and the *youth employment initiative*, which aim to increase active involvement and employment in European industries. However, there remains a substantial gap between the countries with the highest and the lowest unemployment rates for young people. There is a gap of more than 40 percent between the Member States, with the lowest rate of youth unemployment (Germany at 7.4% in November 2014) and the Member States with the highest rates, Spain (51.4%), Greece (50.6%), Croatia (44.8%). A newly skilled generation is needed to drive the development of green economies and accelerate the energy transition.

But, what are the opportunities and challenges for the young people in the Western Balkans? With youth unemployment rate over 50% and fossil fuel based economies, how will EU policies influence the Western Balkans? Which sectors will open employment opportunities? What is the awareness of young people? Are they interested in studying and working in the renewable energy and energy efficiency sector? This paper aims to answer some of these questions, providing a brief overview of the climate and energy situation, and the role played by young people in 4 countries: Macedonia, Serbia, Kosovo and Croatia. As appendix, there is a list of universities that are providing studies related to renewables and energy efficiency.

Sectors particularly vulnerable to climate change in the Western Balkans include water resources, agriculture, biodiversity, energy, human health and tourism. The biggest part of the greenhouse gas emissions comes from the energy sector which is primarily based on lignite-fired power plants. Hydro and biomass play an important role in the renewable energy mix in the countries, and unfortunately solar energy is not a priority, despite the huge potential. Energy efficiency is seen as a priority and employment opportunities are being created. Young people are interested in studying and working in the renewable energy sector, but generally lack information on the academic and professional opportunities in the area.

1. CLIMATE CHANGE AND ENERGY TRANSITION

Human activity is causing climate change. The increase in greenhouse gas emissions in the Earth's atmosphere, especially carbon dioxide, is making the global temperature rise. The increased temperature is causing the climate to change faster than its natural course and the consequences for the human civilization are potentially devastating. Floods, severe droughts, tornados, loss of biodiversity, viruses and bacterial diseases, are just some of the consequences that will change the way humans live today. According to the International Council of Scientific Union, the United Nations Environment Program and the World Meteorological Organization, in order to prevent the most severe impacts of climate change, we will have to limit the rise in the global average temperature by 2 degrees Celsius by the end of the 21st century, relative to the pre-industrial period. Otherwise, we will see truly disruptive changes such as the melting of polar ice caps, a further rise in sea level and weather extremes. However, if we continue with "business as usual" and allow emissions to continue to rise at the current rate, impacts by the end of this century are projected to include a global average temperature 2.6 - 4.8 degrees Celsius higher than present temperature⁴.

To keep the temperature from rising over 2 degrees Celsius, change is needed in many aspects of how humans live now, especially in respect to resources and, most importantly, energy. The current energy supply is based primarily on fossil fuels i.e. coal, oil and gas which contribute to the most of the CO2 emissions in the atmosphere⁵. The challenge we face becomes bigger because of the global increase in energy demand, which is primarily driven by economic growth and the rising population. Stabilisation of emissions at levels compatible with the internationally agreed 2 degree Celsius means a fundamental transformation of the energy industry worldwide, on a pathway to a complete decarbonisation⁶.

Climate change will influence both the economy and employment. Climate change will especially affect the infrastructure on which so much employment depends. Energy, water, transport, and telecommunications are likely to face disruption from flooding, storms, droughts and temperature extremes. However, efforts to mitigate climate change and to adapt to its effects also create employment opportunities in renewable energy sources

⁴ Fifth Assessment Report, The Intergovernmental Panel on Climate Change (IPCC), June 2014.

⁵ 81,7% of the total primary energy supply comes from fossil fuels - International Energy Agency, Key World Energy Statistics, 2014.

⁶ Implications for the energy sector, Fifth Assessment report, IPCC, June 2014.

and energy efficiency, reducing emissions from deforestation and forest degradation, biofuels, and resilient infrastructure⁷.

World leaders are meeting this year in Paris for the climate negotiations at the UN Conference of Parties. Leaders are to negotiate a binding agreement for countries to reduce greenhouse gas emissions and set up a mechanism to finance the energy transition. Each country has a role in setting emission targets, burden sharing and in taking on concrete responsibilities. The negotiation positions of the big producers and consumers of energy, such as the USA, China, and the European Union, will be of crucial importance in order to engender a successful agreement in Paris that will determine the future of the Planet Earth and the human civilization.

The role of the European Union, as the largest energy importer in the world and the third largest polluter, is of key importance for driving a successful energy transition. The Russia-Ukraine crisis has had an impact on energy policies and the European Commission's "Framework Strategy for the Energy Union^{8"}. The main action points in the Energy Union document are related to increasing gas and diversifying its sources, but without a clear commitment to renewable energy sources as the core of the energy system. Gas is the "clean" fossil fuel and often perceived as a transitional element to a renewable energy system. This development questions the EU's real commitment to a climate-friendly low-carbon economy. Nevertheless, the EU has the world's most ambitious commitments on climate change. Having adopted the EU framework on climate and energy for 2030⁹ on 23rd October 2014, the EU set 3 targets by 2030: to cut greenhouse gas emissions by at least 40%, 27% for the share of renewable energy and 27% was set for improving energy efficiency, compared to the levels of the 1990s. Furthermore, the Roadmap 2050 $project^{10}$ of the European Climate Foundation aims to achieve at least an 80% reduction in greenhouse gas emissions by 2050. Achieving this goal requires a fundamental transformation of Europe's energy system. These targets highlight the European Union's position as a world leader in the fight against the climate change, which should ensure the security of the EU's energy supplies and reduce its dependency on imported fossil fuels.

⁷ Fifth assessment report, Climate Change: Implications for employment, IPCC.

⁸ <u>http://ec.europa.eu/priorities/energy-union/index_en.htm</u>.

⁹ <u>http://ec.europa.eu/clima/news/articles/news_2014102401_en.htm</u>.

¹⁰ <u>http://www.roadmap2050.eu/project/roadmap-2050</u>.

2. WESTERN BALKANS - CLIMATE, ENERGY AND YOUNG PEOPLE'S EVOLVEMENT

Natural disasters represent a big threat for the countries of southeast Europe. Their fragile economies have been further aggravated by floods, earthquakes, landslides, forest fires, droughts, heat waves, prolonged winter seasons, and hailstorms occurring in these countries. The effects of these pose a considerable threat to the economies and population of Western Balkans, including Croatia, Macedonia, Serbia and Kosovo.

Croatia is classified as an Annex-I country (industrialized or emerging economies) under the Kyoto Protocol for binding emissions reduction targets. Macedonia, Serbia and Kosovo are classified as Non-annex-I countries (developing countries) without binding emissions reduction obligations. All Western Balkan countries are part of the Energy Community Treaty (ECT) that was signed in October 2005 by the European Union and nine Contracting Parties (CPs). The Energy Community was created for a period of 10 years, ending in July 2016. The Energy Community aims at extending the *acquis communautaire* of the European Union to the participating countries. By joining the Energy Community Treaty, the CPs have committed themselves to implementing the relevant EU rules on energy, environment and competition. In October 2012, the 10th Energy Community Ministerial Council agreed on the implementation of the RES Directive¹¹ on the promotion of renewable energy by the Energy Community. Under the directive, the countries have committed to a binding share of renewable energy as part of their overall energy consumption in 2020.

All four countries primarily produce energy from coal, and secondly from hydro and therefore depend on the hydrological conditions. Natural gas production is not that common for these countries as in Croatia and Serbia there is little, and in Macedonia and Kosovo there is none. The key elements of the energy infrastructure in the Western Balkans were built in the 1960s and 1970s. The age and type of this technology, combined with inadequate maintenance in the 1990s, is presenting serious technical and policy challenges¹². Due to lack of cooperation between the countries, maintenance of domestic energy supply is becoming more expensive. Furthermore, the countries have varying levels of energy import dependency, total primary energy supply, energy mix, and volumes of domestic energy production.

¹¹ RES Directive 2009/28/EC.

¹² BETTER policy brief: PROSPECTS FOR RES COOPERATION MECHANISMS BETWEEN THE WESTERN BALKAN COUNTRIES AND THE EU.

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Croatia and Macedonia import almost half of the energy of their total energy use, Serbia imports one third of the energy and Kosovo is the least dependant on imports with only 9%¹³. The energy demand is expected to increase in the coming decades, and even though all four countries have substantial potential in renewable energy sources they are basing their energy future on fossil fuels. Hydropower is the dominant renewable energy source and even wind, solar, biomass and geothermal energy have considerable potential; so far this has only been explored to a very limited extent by Croatia (wind) and Serbia (biomass).

2.1 Young people

Being a young person in the Balkans has its own challenges. The average youth unemployment rate is nearly 50%. Many young people in the Balkans try to pursue a better socio-economic life outside of their countries. This massive wave of youth emigration in the region reached an alarming proportion before the countries started paying serious attention to this problem. With the creation of the National Youth Strategies and their Action Plans the countries in the region have tried to create a framework that will ensure the resolution of youth struggles linked with education, living requirements and job opportunities. Young people are represented through the National Youth Councils, umbrella organizations of youth organizations that should, in theory, make the voice of young people heard in the institutions. Another mechanism of inclusion of young people is the local youth councils in the municipalities. However, the interests of the municipal youth council members and those of the political parties often overlap, and relevant public participation is lacking, so it is questionable as to whether the local youth councils represent the real needs of the young people. The high rates of the youth unemployment in the region, of nearly 50%, requires a structured approach to this problem that will unify the state institutions, the private sector and civil society in order to provide a better future for the young people in the Balkans.

3. CLIMATE AND ENERGY – THE CASE OF MACEDONIA

Macedonia is a mountainous country with deep valleys, rivers and lakes. Forests cover around 1/3 of the surface and 50% of the country's land is used for agriculture. The biodiversity is invaluable with more than 16,000 species, out of which 854 are endemic. Even though the country covers a small territory, it has 8 climatic regions. The consequences of climate 13 prime is a second for the country of the second second

¹³ Statement of Security of Supply for Kosovo, Prishtina, July 2013.

change are thus expected to vary significantly all over the country, with increased average temperatures and reduced access to water which would increase the likelihood of droughts, forest fires and heat waves. In the north-western parts of the country, the low coastal regions are faced with the risk of increased river levels. Frequent extreme weather conditions (floods, droughts, landslides, fires, illnesses, etc.) are expected to become more frequent, as was indicated by the recent floods in eastern Macedonia¹⁴. The water resources will be one of the most affected areas and there will be an evident drop in the agriculture yields i.e. the tomato yields which could decrease by up to 81% and the apple yields by 50% by 2050.¹⁵

The largest source of greenhouse gas emissions is the energy sector with 73%, followed by agriculture with 13%, and the waste and industry sectors contributing with 7%.¹⁶

The energy sector in Macedonia is characterized by the production of energy from thermoelectric plants (lignite), which constitutes around 66% of total energy production, and hydroelectric plants which makes up around 34% of total energy production. Gas is becoming a strategically important energy source to the country. There are two available options when it comes to gas supply, one is gas from Russia via the South Stream, and the other is gas from Azerbaijan via the Trans-Adriatic Pipeline. The Government has signed an agreement for cooperation with Russia for the South Stream, allowing Russian companies to construct a gas pipeline via Macedonia. The Government has also signed a more general memorandum for cooperation for energy with Azerbaijan.

Under the baseline scenario of the Third National Communication on Climate Change, energy consumption is projected to grow by 48% in terms of final energy by 2032, and by 102% by 2050. The most significant share in final energy consumption is related to diesel, electricity use, and natural gas. The highest increase in the final energy consumption over the period 2011-2050 is expected to be in the transport (around 172%) and agricultural sectors (164%). Increased energy demand is correlated with an increased energy supply, and the baseline of the mitigation strategy is an increased share of imported crude oil and natural gas, a decreased share of coal (after 2032) and an increased contribution of renewable energy sources (excluding biomass) by 11% over the period 2011 – 2050, mainly accounted for by hydro and wind energy. Unfortunately, solar energy is marginalized in the scenarios.

¹⁴ <u>http://floodlist.com/europe/southern-europe-floods-update-macedonia</u>.

¹⁵ Third National Communication on Climate Change, 2014, <u>www.unfccc.org.mk</u>.
 ¹⁶ Ibid.

Measures to influence the energy demand include improving energy efficiency in the building sector, transport sector and promoting lowcarbon fuels, raising awareness campaigns for transportation habits, improving the transport infrastructure and improving the energy efficiency in the industrial processes. One of the significant measures for reducing the greenhouse gas emissions from the waste and agriculture sector is the construction of biogas plants.¹⁷

3.1 Young people's status in Macedonia

Macedonia has a population of just over 2 million people, of which 17.7% are aged between 15 and 24 years old. It has one of the highest unemployment rates in Europe and its youth unemployment rate currently stands at an astonishing 50%¹⁸. As young people account for such a large proportion of the overall unemployment rate in the country, battling youth unemployment is one of the nation's key priorities. Bearing in mind that in certain municipalities the youth unemployment rate is as high as 80%, young people could be declared as, as well as given the status of, a socially vulnerable group.

After a controversial Law for Youth was rejected in 2011, the youth organizations decided to join efforts and through a wide and open consultative process created the National Youth Council of Macedonia¹⁹. The Council represents an umbrella of youth organizations, organizations for youth and youth political wings in Macedonia and represents the voice of the youth in the dialogue with the relevant institutions. Though created in a legitimate democratic process, and currently a candidate for becoming a member in the European Youth Forum, the national institutions in Macedonia still haven't officially recognized the Council as a partner in the creation of relevant youth policies. Other forms of youth representation in the state institutions are the municipal youth councils that are formed in the municipalities with a top down directive from the Government, and few initiated by local NGOs

There is no separate youth policy that is assigned to its own ministry within the institutional framework and ministry division in Macedonia, only a joint agency that deals with youth and sport policies. The combining of these two policies in the same agency in some cases results in insufficient attention to youth issues, but with pressure from the civil society and the National Youth Council, the attention to youth issues is improving. The

http://www.stat.gov.mk/pdf/2015/2.1.15.04.pdf.

¹⁷ National Communication on Climate Change, 2014, <u>www.unfccc.org.mk</u>.

¹⁸ Republic of Macedonia – State Statistical Office, Active Population in the Republic of Macedonia Results from the Labour Force Survey, IV quarter 2014.

¹⁹ <u>www.nms.org.mk</u>.

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process of creating the Youth Strategy 2016-2025 started with inclusive process led by the Agency of Youth and Sport and UNDP mission in Macedonia and shows a positive signs of inclusive consultation process. The aim of the Strategy is to provide a framework for dealing with youth issues related to education, employment and the economic situation and hopefully will improve the status of young people in Macedonia.

One of the most important government institutions that is obliged to train young people, and improve the process for young people looking for employment, is the Employment Agency of the Republic of Macedonia. Research by "Reactor - Research in Action" provides an insight into the effectiveness of the Employment Agency in the area of youth unemployment, as well as the level of awareness among young people of the services that the Agency provides to them with the aim of decreasing the youth unemployment rate. The results obtained from the research can also serve as an indicator of the unemployed youths who have access to active employment measures. For example, only 11.4%of youth stated that they have received advice on how to search for jobs; only 5.3% of them have received information on vacancies; 2.6% of them have benefited from guidance on education and training opportunities; 2.6% were given placement at education/training programs; and 82.5% stated that they have never received any guidance or assistance from the Agency.²⁰ Another important conclusion that can be drawn from the same research is that young people in Macedonia see the importance of the combination of formal education and apprenticeships as the most practical form of assistance in the search to find suitable jobs.

	Frequency	%
Completion of vocational training	14	12.3
Completion of secondary education	2	1.8
Completion of university	41	36.0
Apprenticeship with an employer	22	19.3
Entrepreneurship training to start own business	1	.9
Computer and IT course	10	8.8
Foreign languages	13	11.4
Professional training	8	7.0
Other	3	2.6
Total	114	100.0

Table 1. What kind of training do you think would be most helpful in finding a job?

Reactor – Research in Action. "Youth and the Labour Market", 2012

²⁰ Reactor – Research in Action. "Youth and the Labour Market", 2012, pp. 45.

4. CLIMATE AND ENERGY – THE CASE OF SERBIA

Serbia has been an unfortunate witness to the climate change consequences, greatly exposed to extreme weather conditions, resulting in floods. The direct costs from the floods in 2014 were estimated to be around 600 million Euro²¹. According to the First National Communication on Climate Change, the consequences of climate change in Serbia will mostly affect water resources, agriculture and forestry. Natural disasters are primarily related to flooding, and forest fires have become a serious threat in recent years. Water shortage will affect agricultural yields and production in hydroelectricity plants, but also the usage of water for cooling and other technological processes that take place in the coal thermal stations.

The energy sector is the biggest contributor of GHG emissions with 77.7% of total emissions, with the agricultural sector contributing 14.64%, and transport 11% of total emissions. The analysis showed that in order to reduce GHG emissions from the energy sector we need increase in energy efficiency and renewable energy sources²².

The energy sector in Serbia depends heavily on fossil fuels, which represent more than 50% of Serbia's energy mix, out of which more than 40% is imported. According to the energy balance in 2009, the final energy consumption is composed of 32% oil, 9% lignite, 9% natural gas, 28% electricity and 13% wood²³. Out of the 28% electricity, 65-70% comes from lignite power plants and about 30% from hydropower plants, which would make hydropower about 7.5-8% of the overall final energy. Yet many experts in Serbia claim that wood actually represents15-20% of the overall final energy.²⁴ Experts see the transition potential in district heating systems with the replacement of wood with renewable energy sources. Nevertheless, the technology of the currently installed coal power plants does not allow for an easy switch to the use of renewable energy sources. Serbia's renewable energy sources are mainly hydropower and biomass. The solar energy unfortunately has no significant share in Serbia's renewables.

Furthermore, the large part of the Serbian society cannot afford to pay their energy bills. Around one million inhabitants are entitled to a social benefit payment for basic energy needs of 350kW per month, and over

- ²¹ Srbija i klimatske promene, <u>www.cekor.org</u>, 2015.
- ²² First national communication on climate change under the UNFCCC, 2010.
- ²³ Energy balance final energy, 2009, Ministry of infrastructure and energy.
- ²⁴ Zvezdan Kalmar, energy and climate change coordinator of NGO CEKOR (<u>www.cekor.org</u>).

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60% of households depend on solid fuels for heating and cooking.²⁵ Poverty reduction should be on the agenda of the development of the energy sector. A decentralization of the energy system would ensure poverty reduction as well as sustainable development in the energy sector.

Water management is of great importance to the energy system in obtaining sufficient quantities of clean and sustainable energy by keeping the water resources intact. Furthermore, the development of renewable energy sources and decentralization of the energy system depend largely on agriculture and forestry i.e. biomass and biogas. Only 2-3 % of the national budget has been assigned to agriculture over the recent years, which is very little in comparison to other European countries. According to certain estimates, the potential of biomass energy could be doubled in Serbia, which amounts today to approximately 3,400,000 tons. Of course, these measures must be very thoughtfully matched with the need for sustainable and climate-resistant agriculture and forestry.²⁶

4.1 Young people's status in Serbia

Serbia does not differ to its neighbouring Balkan states in the fact that it too has a high youth unemployment rate. Young people, aged between 15 and 24, represent 12% of the total working-age population of Serbia. According to the Statistical Office of the Republic of Serbia that rate is 49.4%, which leads to several socio-economic issues in the country.

With such a high percentage of unemployed young people, the state has prioritised the creation of a youth policy at the highest institutional level within the country. The Ministry for Youth and Sport is the principle institution that creates legislation connected with youth representation in Serbian society, and is given the task of resolving the issues that affect this vulnerable social group. Serbia started the process of creating its first National Youth Strategy in 2007 and now, in 2015, the process is beginning again with youth CSO representation, in order to ensure the input of young people in the decision-making process. The Serbian National Youth Council - "Krovna Organizacija Mladih Srbije (KOMS)", which works in partnership with local youth offices at municipal level, works to ensure that young people are acknowledged, represented and considered as valuable partners in creating youth policies. Due to their work and

²⁵ Climate vulnerability assessment for Serbia, 2012, Southeast European Forum on Climate Change Adaptation.

²⁶ Ibid.

experience in representing young people in Serbia, KOMS is regarded as a valuable partner in creating the next National Youth Strategy. Although there is adequate communication between the state institutions and youth CSOs, a more structured approach is required in order to battle the high unemployment rates among young people.

As shown in the table below, between April 2008 and April 2011, the employment rate of the working age population dropped from 54% to 45.5%, while the unemployment rate increased from 14% to 22.9%. The economic crisis was especially harsh on young people (aged 15-24) as their performance in the labour market worsened at a faster rate compared to the rest of the working age population. The recorded cumulative drop in youth employment between April 2008 and April 2011 was remarkably large – around 25%, double the drop in employment experienced by the working age population.²⁷

		Apr 2009	Oct 2009	Apr 2010	Oct 2010	Apr 2011	Oct 2011	Apr 2012	Oct 2012	Apr 2013	Oct 2013
Youth population (15-24)	Employment rate	16.8	17.0	15.1	15.2	14.1	13.9	14.3	14.7	14.8	14.2
	Unemployment rate	40.7	42.5	46.4	46.1	49.9	51.9	50.9	51.2	49.7	49.1
	Activity rate	28.3	29.5	28.2	28.2	28.1	28.8	29.1	30.2	29.5	27.9
Working age population (15-65)	Employment rate	50.8	50.0	47.2	47.1	45.5	45.3	44.2	46.4	45.8	49.2
	Unemployment rate	16.4	17.4	20.1	20	22.9	24.4	26.1	23.1	25.0	21.0
	Activity rate	60.8	60.5	59.1	58.8	58.9	59.9	59.7	60.4	61.0	62.2

Source: Statistical Office of Serbia (SORS), Labour force surveys and own calculations

The self-employment rate among Serbian youth (under 6%) is significantly lower than the average level of youth self-employment in the other countries (12%). Multiple social and cultural factors could account for

²⁷ "Impact evaluation of active labour market programmes targeting disadvantaged youth in Serbia". Fondation for the Advancement of Economics, Available online: http://www.fren.org.rs/node/308.

these low rates. Firstly, most young people in Serbia were raised in families without any entrepreneurship experience because the majority of jobs until recently were concentrated within state and public enterprises. Additionally, the unfavourable regulatory framework inherited from the last decade of the twentieth century, the lack of funds available to establish new businesses and underdeveloped business consultancy services have also hampered youth entrepreneurship. However, this kind of employment could prove extremely important in enhancing the prospects for youth employment, especially in circumstances where possibilities for paid work are limited. Moreover, the characteristics of self-employment – flexible working hours, greater independence, increased job satisfaction and the possibility of a higher income – would greatly satisfy the aspirations held by young people.²⁸

5. CLIMATE AND ENERGY – THE KOSOVO CASE

Being a new country, Kosovo's capacity and track record in dealing with climate change is very limited, with other more urgent priorities taking precedent in recent years. The information available on Kosovo's greenhouse gas (GHG) emissions, and projections of which, is still insufficient. Numerous policy and strategic documents have already been developed and adopted, but they are yet to be implemented. Kosovo has no register of sources and emissions of GHGs yet, and nor has it identified the base year from which GHG emissions will be estimated. The country has not yet started to submit National Communications to the Secretariat in the UNFCCC.

Although Kosovo has not signed the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, the country is still obliged to respond to the requirements of the Convention and the Protocol since it is one of the signatories of the Energy Community Treaty, and committed to the EU 20-20-20 targets.

The basis of the energy system is lignite-fired power plants. The lignite reserves in Kosovo, amounting to around 12.5 billion tons, are thought to be the largest lignite reserves in Europe. However, as an aspiring EU country and contracting party of the Energy Community, Kosovo has committed to an energy saving indicative target of 9% of the final energy consumption between 2009 and 2018, and to an increase in renewable

²⁸ Ristić, Dr. Zoran. Pavlović, Liljana. "Potrebe tržišta rada i položaj mladih neyaposlenihlica", Unija poslodavaca Srbije, 2012, pp.8.

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energy sources. Kosovo is aiming to develop renewable energies (wind, hydro and solar) covering 26 percent of its energy needs by 2020 - at the moment renewables account for less than 3 percent. Furthermore, biomass has been identified as a local source on which municipalities can leverage and improve their economies²⁹.

The most important source of GHG emissions for Kosovo is the burning of solid fuels – domestic lignite. The energy sector produces about 82% of the total national GHG emissions. Transport sector GHG emissions are growing due to the increasing number of cars and also increasing fuel consumption. As the incomes of people increase and the road systems become more developed, this category will certainly grow in importance.³⁰

Kosovo plans to slow the increase of GHG emissions through the development of renewable energy sources, sustainable use of natural resources and increased energy efficiency in all sectors³¹. According to the World Bank Institute National Buildings Energy Efficiency study of 2013, the building sector accounts for 48% of energy consumption and represents the largest share of Kosovo's final energy consumption. The largest contribution to the energy saving potential comes from the residential sector (72%), followed by the private and commercial sector (20%). The total energy saving potential of municipal and central public buildings is low in comparison with the other two sectors (8%). This fact suggests that any energy efficiency program should begin with the implementation of measures in public buildings. Furthermore, energy efficiency is expected to improve with the implementation of the Kosovo Energy Efficiency Action Plan 2010-2018, introducing energy efficiency standards, promoting and increasing awareness, an energy auditing system, and establishing subsidy/lending schemes for energy efficiency measures.

Kosovo is facing significant technical problems and loss of electricity. The energy infrastructure needs to be improved and an adequate share of investment should be allocated to that area.

5.1 Young people's status in Kosovo

Kosovo is known for having the youngest population in Europe, with more than 70% of its population of 1.8 million people under the age of thirty

²⁹ Role of Renewable Energy Sources and Efficiency on Economic Development of Municipalities, Hamdi Malushaj, June 2014.

³⁰ Climate Change Framework Strategy, the Ministry of Environment and Spatial Planning, Kosovo, 2014.

³¹ Ibid.

five. The unemployment rate is very high in Kosovo. According to the Labour Force Survey conducted in 2012, Kosovo's youth is two times more likely to be unemployed compared to other age groups of the qualified population elsewhere in its labour force. Among those aged between 15 and 24, 55.3% are unemployed and the rate is even more pronounced among young females – 63.8% compared to an unemployment rate of 52.0% among young males. This statistic not only highlights the alarming rate of the youth unemployment in Kosovo, but also the issue of gender inequality in the workplace – another challenge requiring attention from Kosovar officials.³²

In general, the educational system in Kosovo currently faces a lot of challenges. However there are positive trends in education and employment that the young people of Kosovo could look to in order to improve their employability on the job market. The employment rate for those who possess a higher education diploma is 80% and acts as an incentive for young Kosovars to continue education in order to enhance their career prospects. The unemployment rate among the uneducated is at its highest (62.5%) compared with 15.6% percent for those who have completed higher education – the lowest figure. It is evident that education does improve employment prospects in the local labour market and that as a result, good quality, accessible education should be provided.³³

Kosovo - Unemployment rate 2012 (%)	Male	Female	Overall
No education	56.0	82.1	62.5
Class I-VIII/IX	40.3	59.0	44.6
Secondary vocational school	25.9	36.1	28.0
High school / Grammar School	35.4	50.2	38.8
Tertiary	11.5	24.4	15.6
Total	28.1	40.0	30.9

Table 3: The number of unemployed and the unemployment rate by highest level of education and gender in Kosovo

Source: Results of Labour Force Survey, Kosovo 2012

Kosovo has its own "Strategy for Youth 2013-2017" that aims to improve the position of young people aged between 15 and 24 and the work of CSOs. Research was undertaken with the aim of gathering information

³² Myha.Derenusha, "The youth unemployment in Kosovo", DEMAS Association for Democracy Assistance and Human Rights, 2013, pp. 1. ³³ Ibid.

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for the creation of the Strategy for Youth. 88 youth CSOs were identified, which were considered to represent the voice of young people in Kosovo. Although Kosovo does not have a National Youth Council, such umbrella organisations do exist in other Balkan countries and there is potential for its establishment in Kosovo. The aim of such a project would be to create a coherent voice that represents and involves the 88 youth CSOs that were identified in the country.

Additionally, the results of other research in the field points to the consolidation of the Local Youth Action Council (LYAC)and that it is considered as a part of civil society. According to the same study, there are 33 LYACs which constitute 89% of coverage in the 37 municipalities. Four municipalities do not have a LYAC and these are new or smaller municipalities, with a greater proportion of population of Serbian ethnicity. However, the process of the establishment of LYACs in these municipalities has already begun.³⁴ Similar to the relationship between LYACs and their respective municipalities, the Central Youth Action Council (CYAC) is responsible for representing the voice of youth in communication with the central level institutions (mainly the Ministry for Youth, Culture and Sport).

It is important to stress, that young people in Kosovo do not have opportunity to study renewables and energy efficiency i.e there is no university that is providing these kind of study program, and this is of concern for the development of low-carbon economy future of the country.

6. CLIMATE AND ENERGY - THE CASE OF CROATIA

Croatia has also been affected by heavy rains and severe floods, with invaluable human and material losses caused in 2014³⁵. Extreme climate variations have a strong negative effect on the country's socio-economic development, notably on the country's economy which is so highly dependent on agricultural and tourism.

As an EU member since 1 July 2013, Croatia has to develop and introduce its own national climate change adaptation strategy by 2017. In the process of accession to the EU Croatia has transposed legislation and implemented policies from EU's Climate and Energy package. Croatia prepares and submits its annual reports under the UNFCCC and Kyoto

³⁴ Kosovo Strategy for Youth 2013-2017, Ministry of Culture, Youth and Sport, Prishtina, 2013, pp. 12.

³⁵http://www.reuters.com/article/2014/09/14/us-croatia-flood-idUSKBN0H90IN20140914.

Protocol. The biggest source of GHG emissions in Croatia in 2010 is the energy sector (73%), followed by agriculture (11,4%), industry (11,3%) and waste $(3.8\%)^{36}$.

Much of Croatia's energy requirements are still met by from coal, and the majority of the country's oil is imported from abroad. The energy strategy (2009) aims to build two coal-fired power plants and mentions the possibility of initiation of a Croatian nuclear energy program and radioactive waste disposal sites. Furthermore, the Croatian Government has granted licences for exploration and exploitation of hydrocarbons in the Adriatic Sea to oil companies. Despite the EU commitment targets and the renewable potential in solar, wind and biomass, the recent decisions of the Croatian Government question the commitment of the country for developing a low-carbon economy.

Croatia has high wind and solar energy potential and, while hydropower has had stagnant trend over the last twenty years, solar power has become almost completely obsolete The strategic objectives of the energy strategy (2009) stand for 20% RES in the final energy consumption by 2020 and 35% of electricity to come from RES, including large hydropower plants by 2020, in the overall electricity generation. Although an increase in "clean" energy is very positive from an ecological point of view, the uncertainty of climate change is forcing further diversification, into sources such as geothermal or biomass energy. Hydropower, solar power and wind power plants will most certainly be affected by climate change. The drop in hydropower potential, as a result of diminished precipitation and reduced surface runoff over the coming century is particularly worrying: a reduction of as much as 50% in hydropower output is likely by the end of the 21st century.³⁷

According to the UNDP study, the achievement of the energy efficiency measures in 20% of residences would open 7,000 direct jobs over the next decade. Achieving the objectives from the Energy Strategy for the 2030 in the field of biomass cogeneration (heat and electricity) and the domestic market of locally produced biomass (pellets, briquettes, wood chips) would open 5,000 direct and 55,000 indirect, induced jobs, and achieving the objectives of the energy strategy for 2030 for solar thermal systems would open 1,300 directly and 2,000 indirectly, induced created jobs, the UNDP study concludes.

³⁶ Fifth National Communication of the Republic of Croatia under the UNFCCC.

³⁷ UNDP, 2008.

6.1. Young people's status in Croatia

Croatia also has its own problems with youth unemployment and its EU accession has had little effect in decreasing the youth unemployment rate in the short term. With young people aged 15-24 accounting for 11.7% of the population, and a youth unemployment rate of staggering 44,8% (Eurostats, January 2015) Croatia faces a struggle to provide qualitative employment, education and inclusion for this social group.

Logically, these worrying trends have raised awareness in the minds of the public about the position of young people in the labour market. It appears as though a number of political decision-makers and experts have begun to comprehend the potential detrimental effects should these trends continue. EU's Youth Guarantee implementation is facing structural challenges and the stakeholders which are most affected by this issue, young people themselves, are largely excluded from the debate.³⁸ When evaluating the process of cooperation between youth organisations and decision makers within the institutions, it becomes obvious that both sides are initiating communication regarding the topic in their own interests. However, with regards to the reception of the ideas and initiatives, the members of the youth organisations are more often subjected to a negative reception from the state institutions than vice versa. Although it should still be noted that the umbrella organisation of youth organisations in Croatia, the Croatian Youth Network (Mreža Mladih Hrvatske – MMH) makes a significant effort in creating a unified youth voice that demands the inclusion of young people within the decision-making process.

As with other countries in the region, Croatia has the same problem of institutional ineffectiveness and the challenge of implementation of the laws and strategies. The quality of the work that the Croatian Employment Service (CES) undertakes in the country is not to a satisfactory standard, if the reaction of young people is considered. Young people view themselves as the "clients" of the CES framework and they regard the institution as the primary service point that is supposed to provide help and quality information about potential jobs and assist them in finding employment with private enterprises.

Croatian Youth Network (MMH). Available online:

http://www.mmh.hr/files/ckfinder/files/Whos%20afraid%20of%20the%20big%20 bad%20crisis.pdf.

 $^{^{38}}$ Buković. Nikola, "Who's afraid of the big bad crisis? - The structured dialogue on youth unemployment",

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As the newest EU member country, Croatia held its first "EU Job fair³⁹" on 4th October 2013 where 88 employers were present and more than five thousand people attended to look for a development opportunity, however there is no data on how many people got actually employed as a result of the fair.

Building an employment system that is welcoming of young people requires coordination of the societal groups, institutions and private enterprises. While the present legislation in Croatia seeks to protect workers by imposing strict regulations that makes it difficult to terminate the employment of workers, Croatia's youth find it difficult to even be considered as potential members of the work force. More and more employers are unwilling to hire new employees as a result of the fear that, in times of crisis, they will not be able to lay-off some of the workforce in order to save the company. In this kind of environment, young people are usually the most vulnerable group, as they are more exposed to the corporation's prejudices. Although not every position within a company requires a university degree, companies add this requirement to impose unrealistic employment demands. Also, the issue with employing young people is the fact that the companies usually do not possess the knowledge on how to transfer all of the required skills to a young person who lacks significant work experience. Employers often seek to employ those who have prior experience, rather than those that would require additional training.

7. CONCLUSIONS / CLIMATE AND ENERGY

This is general overview of the most common patterns in all four countries, subject to this analysis. These conclusions focus on the current situation in the countries and the opportunities that arise from the mitigation and adaptation scenarios, as well as the present and future energy development.

- ✓ The countries are vulnerable to natural disasters, especially floods and forest fires, therefore knowledge and expertise in **disaster risk management** will be needed and job opportunities will be opened for creating **insurance** programmes and social **protection measures**;
- ✓ Water sector will be the most vulnerable in the countries concerned. Water shortage will affect the agriculture and the energy sector, i.e. the production from hydropower plants, but also the usage of water

³⁹<u>https://ec.europa.eu/eures/main.jsp?lang=en&catId=10631&myCatId</u> =10631&parentId=20&acro=news&function=newsOnPortal.

technological processes in the coal thermal plants. Expertise and knowledge will be needed in strengthening and modification of the physical infrastructure, construction of dams and reservoirs, water saving measures, rainwater collection appliances, water reuse and recycling etc.;

- ✓ Yields will decrease in the agriculture sector and will affect the economies of the countries. The agriculture sector contributes significantly in the employment of the local population therefore many people might lose their income. On the other hand, mitigation and adaptation measures will demand knowledge and expertise consequently jobs will be opened for organic farmers, micro irrigation systems managers (drip irrigation, micro sprinkler and spraying), organic fertilizers, biogas production managers, and composting;
- ✓ Energy demand will increase in all countries, mostly from the transport and agriculture sector. The energy demand is planned to be met with imported crude oil and natural gas and increased share of renewable energy sources. In order to decrease the energy consumption, raising awareness campaigns and education of the citizens is critical. Jobs will be opened in promotion, campaigning, environmental education, and sustainable marketing;
- ✓ Energy infrastructure is out of date and needs significant investments for renewing and advancing the system. Infrastructure development requires knowledge in engineering, maintenance, installation, software systems and geology;
- ✓ Coal is dominant in the energy mix. The obligations to the Energy Community creates the necessity to cut emissions and replace old coal fired power plants with new ones, preferably based on gas or renewable energy. This process of adaptation will create job opportunities in development, construction, operations, consultancy, research and development, engineering, and software development;
- ✓ Gas is becoming strategically important for some countries, such as Macedonia and Croatia, and jobs will be opened in the gasification process, construction and installation, operations and maintenance;
- ✓ Hydro is an important energy source for the countries and it will remain to be the case. Hydropower sector requires maintenance and skilled personnel with **engineer**, **entrepreneurial**, **innovation**,

marketing, information and communications technology (ICT);

- ✓ Energy efficiency is a priority for most of the countries and this sector will create significant number of jobs. Energy efficiency in industrial processes, building and transport sector is a priority that will create employment opportunities in building insulation for example. Besides the technical skills required, skills related to innovation are needed, interdisciplinary skills, problem-solving, design and systems thinking;
- ✓ Transport will continue to have an important role in emissions mitigation and will require significant policy interventions and infrastructure investment in areas such as public transport, and take measures to encourage walking and cycling. It will be necessary to develop and maintain awareness of the regulatory policies, as well as, adjust infrastructure for alternative transport routes and organization of raising awareness campaigns;
 - Biomass and biogas are an energy source that represents a significant share in the energy mix of the countries and supports the economies on a local level. Knowledge and expertise will be required in the sector for **production and operation of biomass and biogas plants i.e. biomass production managers.** Furthermore, employment opportunities could be created in **waste collection, sorting and recycling;**
 - Wind as energy source, is put in the scenarios for mitigation of GHG emissions and this sector could create employment opportunities. The knowledge, expertise and job profiles in this sector would be related to wind power design engineers, wind resource assessment specialists, wind service technicians and specialists for small wind turbine installers.

7.1 Conclusions concerning young people in the Western Balkans

- ✓ With youth unemployment of around 50%, young people can be considered as a **socially vulnerable group** in the Western Balkans;
- ✓ There is **lack of structured dialogue** between the institutions and young people and they are partially included in the debates for policies that concern them;

- ✓ Young people are represented in the institutions through umbrella organizations, National Youth Councils, and Local Youth Councils. However budget planning process, at both local and national level does not take into account the financial needs for the development of the youth sector;
- ✓ There is a lack of mechanisms to support innovation and entrepreneurship among young people consequently the selfemployment rate remains low;
- ✓ Structured cooperation is missing between the universities and the companies, therefore young people lack skills and practical experience when they finish their studies;
- Employment agencies are ineffective for young people and do not provide the necessary support, when it comes to employment plan, training, skills and competence development of the labour market, especially in the rural areas;
- ✓ Although universities on the Balkan provide studies that give of technical skills, for the students there is a lack of flexibility when it comes to updating or changing the curriculum in order to meet the needs of the job market.

The on-line survey⁴⁰, "Interested in climate change", was conducted in the period of 15 February to 15 March 2015. The aim was to assess the awareness of young people (aged 16-24) on climate change and energy as well as their interests in studying or working in the clean energy sector (RES/EE). It was promoted via social media, partner youth organizations and the National Youth Councils in the countries. Total of 485 young people answered the survey. Even though this number is not statistically relevant, it might give us certain indications and food for thought. The answers from the survey show us these conclusions:

- ✓ Young people think they know what climate change is, but large part of them actually does not (questions 1 and 2);
- ✓ They have a general idea for the cause of climate change and the possible solution (question 3 and 4);
- They are interested in studying and working in renewables and energy efficiency field, but there is lack of awareness and information on universities and companies that provide these opportunities (question 5, 6, 7 and 8);

⁴⁰ Appendix I.

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- They have interests of studying renewable and energy efficiency from many different aspects, such as engineering, social and science aspect to architecture, law and economy (question 9);
- ✓ There is an entrepreneurial potential in the renewable and energy efficiency and young people because they see themselves working in the clean energy sector even though some of them think there are no employment opportunities (question 8 and 10);
- ✓ From the universities research⁴¹, we can conclude that Serbia has the biggest number of universities for young people to study renewable energy sources and energy efficiency, followed by Croatia and then Macedonia. Young people in Kosovo do not have the possibility to study renewable energy sources and energy efficiency.

8. RECOMMENDATIONS

- Reduce dependence of fossil fuels, focus on decentralization of the energy system by setting up a mechanism for local renewable energy production that will alleviate poverty and actively involve citizens in the process;
- ✓ Regional and cross-border cooperation to be increased and include knowledge-sharing between Governments, civil society, national hydrometeorogical institutes, private sector and universities, and knowledge transfer from EU countries;
- Regional cooperation would allow a decrease of costs for the countries for maintenance of the domestic energy supply and for renewal and development of the energy infrastructure;
- Solar energy has a huge potential that is underused and it should be seen as a priority for renewable energy source. The Governments should set up a mechanism for supporting the solar industry and develop a program that will create jobs;
- Controlled cutting of trees and proper forest management measure to be implemented when utilizing the biomass potential;
- ✓ Local and national authorities, researchers and local businesses

⁴¹ Appendix II.

should create programs for new jobs for workers from declining industries and provide training;

- Every entity should ensure gender balance criteria and involvement of women when developing the programs, policies and measures;
- ✓ Water engineering and management knowledge and expertise to be developed, therefore cooperation with European universities to be established, example with Dutch universities such as University of Twente⁴²;
- ✓ Work on tolerance, respect, cultural diversity and understanding among citizens especially young people;
- Universities should improve their promotion and communication strategy for targetting young people;
- Regional cooperation between the universities should be established to increase the youth mobility, learning experience and knowledge exchange, and targeted training and education programmes;
- Cooperation between the universities and the companies should be developed for creating innovation and entrepreneurship hubs for young people;
- ✓ Interdisciplinary skills, strategic and leadership skills, entrepreneurial skills, environmental awareness, systems thinking and risk analysis skills should be the focus of the employment agencies, training centres and NGOs;
- ✓ The employment agencies to create a job mobility scheme to help young people find a job, traineeship or apprenticeship in other EU countries, by the example of "Your First EURES job" with a system that ensures support and follow up in the process;
- Employment agencies should develop a mechanism to reach to young people in rural areas as they are largely excluded from the services;
- Creating a programme that will incorporate youth activism, training and volunteerism in order to motivate the youth, make them aware of their competencies and teach them how to look for a job;

⁴² <u>http://www.utwente.nl/ctw/wem/</u>.

- Universities should re-evaluate their programs and offer their students opportunities to gain practical knowledge and experience in companies and other organizations;
- ✓ Utilize the EU financial instruments i.e. the structural and investment funds (Croatia) and third country funds 2014-2020⁴³ for investments in sustainable economic development and environmental protection.

⁴³ <u>http://www.greens-efa.eu/your-guide-to-eu-funding-11778.html</u>.

APPENDIX I ON-LINE SURVEY FOR YOUNG PEOPLE 16 - 24

Total 485 young people answered the survey, out of which, **218 from Macedonia, 134 from Serbia, 73 from Kosovo and 60 from Croatia.**



Age: 16-24

The target group of the survey were high school and university students. 62% of the people that answered the survey are in the age range from 21 to 24 which tell that the students are more interested in climate change than the high school students.



Gender: 60% female, 40% male
Gender



1. Do you know what climate change is?

92% answered they know what is climate change which shows young people's confidence that they are aware of the issue. The next questions tells something else.



2. Is this statement true? "Climate change is causing global warming"

60% answered "yes" which is not correct and 16% are "not sure" which makes 76% are not aware of what exactly is climate change. This shows big gap of what they think they know and what they really know of climate change.



3. What do you think is the biggest cause for climate change?

50% the surveyed young people answered correctly "fossil fuels", 20% answered "factories" and 10% think that "transport" is the biggest cause for climate change. All answers were correct but only half of them answered the most correct answer.





4. What do you think the best solution for climate change is?

Almost 67% answered "renewable energy sources" and 13% answered "energy efficiency" which were the correct answers. Interestingly, the percentage of young people that answered "**recycling**" (9%) was very close with "energy efficiency" percentage.



5. Do you know a university that is providing studies in the field of renewable energy and/or energy efficiency?

"No" and "not sure" counts for 67% which shows a high percentage of young people lacking information on universities that provide RES / EE related studies.



6. Do you know a company that is working in the field of renewable energy and/or energy efficiency?

Interestingly, more young people know a company that deals with RES or EE (40%) in comparison to the universities (33%). Again, a large percentage of young people are not aware (60%) of a company that works in the field of RES and EE.



7. Are you interested in studying renewable energy and/or energy efficiency?

When you combine "yes" and "yes, but I need more information" it turns out that 70% are interested to study renewable energy and/or energy efficiency, and more than half of them needs more information. This shows a big potential for the universities and the society for creating a pool of clean energy talents.





8. Are you interested in working in the field of renewable energy and/or energy efficiency?

High 73% are interested in working in the field of renewable energy and/ or energy efficiency, but half of them need more information.



9. Which field from renewable energy and/or energy efficiency is of your interest?

There is a big variety in the interests of studying RES/EE. There is no field that is obvious and can be defined as "the most desired". Nevertheless, *engineering* with 21% is the most preferred choice, followed by *social aspect* (19%), *science* (15%), economy (12%) and law (10%). In "other" choice of answer, *public policy, greentech, security and IT* were mentioned.



10. Do you think there are employment opportunities in the field of renewable energy and/or energy efficiency?

More than half (56%) of young people think there are employment opportunities in the RES/EE field. Having in mind that 73% want to work in this field (question 8), there is *entrepreneurship* potential for self-employment and creating jobs.



APPENDIX II

LIST OF UNIVERSITIES THAT PROVIDE STUDIES RELATED TO RENEWABLE ENERGY SOURCES AND/OR ENERGY EFFICIENCY⁴⁴

REPUBLIC OF SERBIA

UNIVERSITY OF BELGRADE

Faculty of Economics

Degree: Master studies

Study programme: Economics and Management of Energy

http://www.ekof.bg.ac.rs/

The student acquires knowledge in the field of economics, energy, organization of energy subjects, pricing and tariffs in the energy sector, energy systems, investment management and investment policy in energy management, human resource management, quality management, operations management and performance management, as well as macroeconomic facilities necessary for the formulation and implementation of energy policies.

Faculty of Architecture

Degree: Specialized academic studies

Study programme: Energy efficient and green architecture

http://www.arh.bg.ac.rs/

This is a second degree one-year programme that has the following objectives:

- deepening the knowledge necessary for design, construction and evaluation of energy efficient and green buildings;
- professional qualification (input basis for a license) to work in the field of analysis of energy efficiency and energy certification of buildings;
- professional qualification as an input basis for the exam and obtaining the title of LEED-G (reen) A (ssociate).

⁴⁴ Programs might not be specialized only for RES or EE, but include in their programs related subjects.

Faculty of Civil Engineering

Degree: Specialized academic studies

Study programme: Energy Efficiency, Maintenance and Value Assessment of Buildings

http://www.grf.bg.ac.rs/

The condition for admission to the programme is completed master academic studies with at least 300 ECTS credits in the field of civil engineering and/ or related fields. Students gain professional qualifications for the exam and obtain a license for analysis of energy efficiency and energy certification of buildings. In addition, students gain basic knowledge in the field of maintenance and valuation of buildings.

Faculty of Forestry

Degree: Bachelor and Master studies

Study programme: Ecological Engineering for Soil and Water Resources Protection

http://www.sfb.bg.ac.rs/

In bachelor and master studies of "Ecological Engineering for Soil and Water Resources Protection" students qualify for watershed (areas of erosion), management from bio-ecological, technical and economic aspects.

The following competency is acquired through this study programme: full competency for the jobs in the field of ecological engineering, all jobs in the field of afforestation, production of planting stock for afforestation, application of techniques and standard technologies in the protection of soils and waters, in the first place from erosion and torrent flows, highly skilled jobs in amelioration in land restructuring and the restructuring of torrent water flows.

UNIVERSITY OF NOVI SAD

Faculty of Agriculture

Degree: Bachelor and Master studies Study programme: Water management <u>http://www.polj.uns.ac.rs/</u>

Water shortage and droughts; flooding and excessive amounts of water; pollution of water resources are significantly important issues. The possible solutions to these problems related to agriculture, water and the environment are the subject of interest of this study programme.

Faculty of Technical Sciences

Degree: Bachelor studies Study programme: Clean Energy Technologies <u>http://www.ftn.uns.ac.rs/</u>

During four years, the students will acquire knowledge in energy, society and environment, calculating probabilities and statistics, energy efficiency, cost-effective and energy efficient electrical systems, clean electrical energy sources, planning in environmental engineering.

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STATE UNIVERSITY OF NOVI PAZAR

Department of Multidisciplinary sciences

Degree: Master studies

Study programme: Energy Efficiency of Buildings

http://www.np.ac.rs/

Competences of graduate students

- examine the main theoretical, methodological and practical implications of different theoretical systems and models,
- identify problems independently, abstract and define them in a way that allows scientific or professional study,
- plan, design and conduct research in various areas of energy efficiency,
- establish team communication and undertake an organizational and leadership role in a team,
- understand and apply knowledge from the field of energy efficiency, for planning and intervening in different areas of technology,
- understand and implement the principles of design, administration, processing, interpretation and evaluation of the required measuring instruments.

Degree: Bachelor degree

Study programme: Energy efficiency, renewable energy and environmental impact

Competences of graduate students

• Understanding fundamental theoretical, methodological and practical implications of different theoretical systems and models,

- independently identifying problems, abstract and define them with the scientific or professional research,
- plans, designs and conducts research into various areas of energy efficiency,
- precisely formulates findings of the research
- understanding and applying knowledge in energy efficiency for planning and implementing interventions in various areas of technology,
- understands and applies the principles of construction, administration, processing, interpretation and evaluation of the necessary measuring instruments.

REPUBLIC OF CROATIA

UNIVERSITY OF ZAGREB

Degree: International Master Studies

Study programme: Sustainable Energy Engineering

http://www.fsb.unizg.hr/

The programme is carried out by the Department of Thermodynamics, Thermal and Process Engineering and the Department of Power Engineering, at the Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, within the Tempus Joint European Project in a close co-operation with the Royal Institute of Technology, Stockholm, Sweden, which has already successfully established the international SEE programme similar to the present one, as well as with other consortium member universities: University of Rijeka, Croatia; University of Split, Croatia and University of Padova, Italy.

UNIVERSITY OF SPLIT

Faculty of Civil Engineering, Geodesy and Agriculture

Degree: Master Studies

Study programme: Water Management and Environmental Engineering http://www.gradst.unist.hr/

The program educates engineers enabling them to solve environmental

and water resources problems by applying principles from natural sciences, engineering, economics and other disciplines. Prospective students will be provided with the engineering and scientific fundamentals in order to be able to face current and future engineering and environmental problems.

UNIVERSITY OF RIJEKA

Faculty of Economics

Degree: Specialized academic studies Study programme: Energy Economics <u>http://www.efri.uniri.hr/hr/</u>

This programme offers developing skills and techniques required to create sustainable business strategy; increasing the efficiency of the energy sector; enabling objective assessment of the success of energy projects; improving the quality of service provision in the energy sector; new knowledge on financial derivatives for trading purposes and protection from risks; optimize financial management; improving the skills of a successful planning in the energy sector; faster adaptation to European standards; developing skills and techniques required for projects and EU funds; new knowledge about the so-called. smart energy systems from the energy strategy of the EU and the US; new knowledge about how to customize the operation of energy enterprises methods of regulation of the energy sector.

UNIVERSITY OF OSIJEK

Faculty of Mechanical Engineering

Degree: Master Studies

Study programme: Energy plants

http://www.sfsb.unios.hr/

This programme offers knowledge and skills in research, development, introduction and application of new methods and tools in the design, manufacturing, reconstruction, installation and maintenance of power plants, energy efficiency and renewable energies.

REPUBLIC OF MACEDONIA

UNIVERSITY "SS. CYRIL AND METHODIUS" - SKOPJE, MACEDONIA

Faculty of Mechanical Engineering

www.mf.ukim.edu.mk

Degree: Bachelor of Science in Mechanical Engineering

Study programme: Power Engineering and Environment

What is interesting about this study is that despite the technical subjects, such as, "Fundamentals of renewable energy sources", "Energy and ecology", "Energy from waste", etc. there is relation to management and business subjects, such as "Entrepreneurship and Small Businesses".

Degree: Master of Science in Mechanical Engineering

Study programme: Power engineering and environment

Relevant subjects in the study include "Optimization of energy systems", "Energy systems management", "Constructing hydro technical plants" etc.

Faculty of Electrical Engineering and Information Technologies

www.feit.ukim.edu.mk

Bachelor studies

Degree: Bachelor of science in Electrical Engineering

Study programme: Power Engineering and Management

The first year is the same for all programmes and the division comes in the second year. Relevant subjects include "Fundamentals of Power Engineering", "Renewable Energy Sources", "Small Hydro Power Plants, "Project management", "Photovoltaic Systems" etc.

Degree: Bachelor of science in Electrical Engineering

Study programme: Electric Power Systems

This programme is similar to the "Power Engineering and Management" programme and focuses more on the electronics and electric networks. Relevant subjects include "Energy management systems", "Energy Efficiency And Environment", "Photovoltaic Systems" etc.

Master studies

Degree: Master of Sciences of energy efficiency, environment and sustainable development

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Study programme: Energy efficiency, environment and sustainable development

The purpose of the study program is to enable leading highly competent engineering staff for research, development, design and implementation of complex interdisciplinary projects in the areas of energy efficiency, the impact of electricity on the environment and sustainable development.

Degree: Master of Science in Regulation in Energy, Electronic Communications and Transport

Study programme: Regulation in Energy, Electronic Communications and Transport

This programme provides knowledge on the need to establish a regulation in the fields related to transport of goods, commodities, people or information through large network systems, i.e. power and natural gas systems, electronic communication systems and transportation networks.

Faculty of Technology and Metallurgy

www.tmf.ukim.edu.mk

Master studies

Degree: Master of science in Environmental engineering

Study programme: Environmental engineering

This is not very closely energy related study, but it studies very important factors associated with the energy sector with subjects like "Air pollution", "Industry and environment", "Sustainable development", "Waste management", "Clean production", "Environment management" etc.

UNIVERSITY "SS. KLIMENT OHRIDSKI" - BITOLA, MACEDONIA

Technical faculty

www.tfb.edu.mk

Degree: Bachelor of science in Energy and environmental protection

Study programme: Energy and environmental protection

This three years study provides subjects closely related to energy and environmental protection, including subjects such as "Renewable energy"

sources", "Mechanical engineering for environmental protection", "Energy and renewable energy in rural areas" etc.

STATE UNIVERSITY OF TETOVO

www.unite.edu.mk

Institute of Technology and Ecology

Private faculties:

Integrated Business Faculty – Skopje, Macedonia

www.fbe.edu.mk

Bachelor studies

Degree: Bachelor of science in Environmental economy and Sustainable development

Study programme: Environmental economy and Sustainable development This is a 3 years programme including economic and management aspects in the environment. The programme is a good mix of business strategies and sustainable development in term of environment. Relevant subjects include "Energy efficiency", "Environmental policies" etc.

Master studies

Degree: Master of science in Environmental economy and Sustainable development

Study programme: Environmental economy and Sustainable development

The programme is interesting because it combines the economic and law aspect of the environment and energy. Relevant subjects include "Environmental law", "Energy efficiency", "Corporate Social Responsibility in Environment", etc.

MIT University - Skopje

Faculty of ecological resources management

www.mit.edu.mk

Through practical application of our scientific-research methods, together we will set the standards for respecting environmental values, learn how to use natural resources in a sustainable manner, provide efficient assessment of environmental and energetic safety as well as of climate



changes. The priority of this study program is to learn and establish EU standards and apply EU values concerning sustainable development and nature.

*FOR KOSOVO THERE WERE NO DATA FOUND ON UNIVERSITIES THAT PROVIDE PROGRAMS OR STUDIES RELATED TO RENEWABLE ENERGY SOURCES AND/OR ENERGY EFFICIENCY

ABOUT THE AUTHORS

Antonio Jovanovski is a green activist since 2009 when he initiated the environmental youth NGO Go Green (www.gogreen.mk) and served as President until 2013. Prior that he has been a youth activist since 2003 holding leadership positions in AIESEC Macedonia and AIESEC France (www. aiesec.org). Currently he is a Board member at the National Youth Council of Macedonia (www.nms.org.mk). Antonio holds a bachelor degree in Marketing and is pursuing his Master thesis in the programme "Environmental economy and sustainable development". His area of expertise is strategy, leadership development, campaigning, climate change, energy and waste management. Currently he lives in Brussels and works for the Greens in the European Parliament (www.greens-efa.eu).

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Aleksandar Trpkovski has been a youth activist since 2010 when he joined the AIESEC network (www.aiesec.org). Within his local AIESEC branch in Macedonia, he held a number of leadership positions and completed an internship engagement in AIESEC Russia. His current role involves green activism and the management of the youth department in the youth environmental organization Go Green (www.gogreen.mk). Aleksandar holds a bachelor degree in Political Science and is pursuing a Master's degree in European Institutions and Policies" at the Iustinianus Primus Faculty of Law in Skopje.

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