Oct 30th, 1:30 PM - 3:00 PM

A Review on the Kosovo's Challenge on Green Energy Generation and Paris Climate Agreement

Mevlan Qafleshi
University for Business and Technology - UBT

Driton R. Kryeziu
University for Business and Technology - UBT

Driton Qafleshi
University for Business and Technology - UBT

A Review on the Kosovo's Challenge on Green Energy Generation and Paris Climate Agreement

Mevlan Qafleshi[1], Driton R. Kryeziu[1], Driton Qafleshi[1]

[1] University for Business and Technology, Kalabria, 10000 Prishtina, Kosovo

Abstract. Scientifically it is proven that anthropogenic greenhouse gases (GHG) cause global warming. Global community, through agreements and protocols, aims that by the end of this century to keep the temperature rise below 2°C the average temperature of pre-industrial levels. Efforts are made to limit this rise to 1.5°C. In order to scale down the CO_2 emissions countries collaborate under the United Nations Framework Convention on Climate Change (UNFCCC) to cope with climate impacts caused by anthropogenic GHG. In 2015 in Paris, 196 countries reached and signed the Paris Climate Agreement (PCA) to limit this temperature rise and set target of net-zero CO_2 emissions by 2050. In light of the PCA long-term global goals, European Union (EU) has set goal that by 2050 to cut the emission levels of GHG by 80 to 95 percent in comparison to 1990. The scientific consensus is that temperature rise chiefly originates from CO_2 emissions. Globally, only the electricity generation from fossil fuels contributes with 40% to the total GHG emissions. In Kosovo 5% of energy is from renewables, 95% is from lignite burning thermal power plants (TPP). Only form TPP the annual emissions of CO_2 surpass 6 Mt. Although this is minuscule compared to great contributors to GHG emission, Kosovo, although not being a party to the UNFCCC, but having a clear European perspective should set a legal framework and dedication to line up with world and EU legislation and acknowledge its responsibility to accomplish the PCA objectives.

Keywords: Kosovo, green energy, global warming, Paris Agreement

1 Introduction

The greenhouse effect (GHE) is a natural process that specific gases in atmosphere selectively absorb or allow to pass through different wavelength radiation. Around 56% of solar radiation reaches the earth surface which heats the land and oceans, and a portion of it is emitted upwards. This long wavelength radiation reaches the atmosphere and gets absorbed by some gases (Fig. **1**). Thus this radiation heats up the atmosphere which emits it back to the earth causing an increase of the temperature of atmosphere and earth in general. This effect maintains the surface temperature of 15°C and makes the Earth livable for humans and other species. Without the GHE our planet would be -18°C cold. However, the elevation in GHG, particularly CO_2 (which absorbs energy in a range of 2000-15000 nm), is causing climate change worldwide due to disbalance in energy. Climate change is the phrase scientists use today to describe the complex alterations impacting our planet's weather and climate systems as a result of rise of GHG concentrations. The GHE was first proposed in the 19th century by J. Fourier. He ascertained that without its atmosphere our planet Earth would be colder. S. Arrhenius, a Swedish physicist, in 1896, was the first to correlate an increase in carbon dioxide gas from burning fossil fuels with a warming impact. J.

E. Hansen in an address, almost e century later, to the USA Congress attributed the GHE the cause of the global climate change [1].

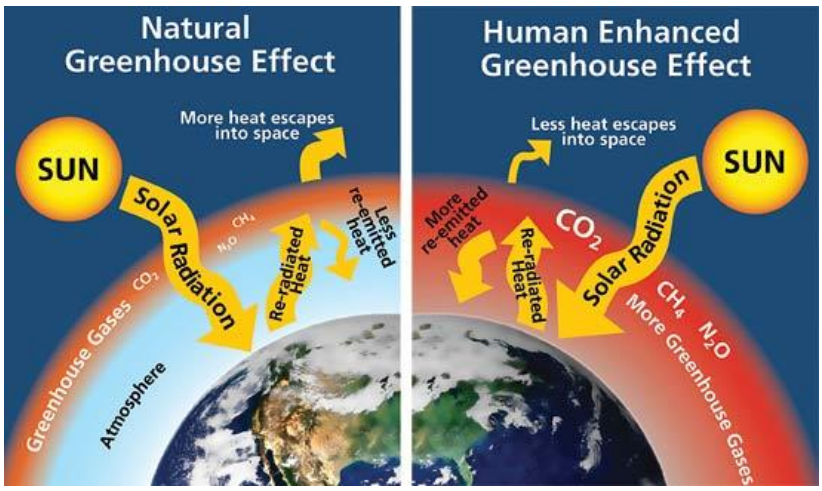

Fig. 1. A Simplified schematic depiction of natural greenhouse effect (left) and human enhanced greenhouse effect (Credit [2])

CO_2 levels now are at the highest they've ever been in at least 3 million years. Despite the fact that they only make up 0.04 percent of the atmosphere, this equates to billions Gt of heat-trapping gas. For example, humanity emitted 36.44 Gt of CO_2 into the atmosphere in 2019, which will linger in the atmosphere for hundreds of years. As a result, there are enough CO_2 molecules to cover the whole atmosphere in a heat-trapping blanket [3]. Based on the measurements, a report presented by Intergovernmental Panel on Climate Change (IPCC) asserts that the temperature in last decade (2011-2020) was 1.09°C higher than during 1850-1900. Also, in the last five years, the temperature hit the hottest record since 1850. There is a three times rise in the sea water level in comparison to 1901-1971 (**Error! Reference source not found.**). Since the 1990s, human impact has been "extremely likely" (90 percent) the major cause of worldwide glacier retreat and Arctic sea-ice loss [4].

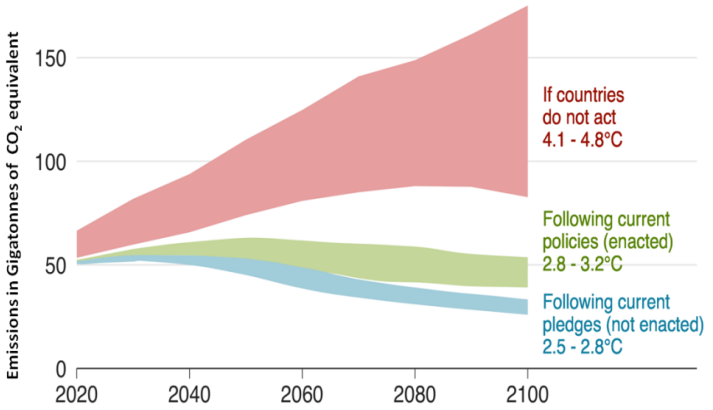

Fig. 2. Emissions in Gt of CO_2 eq and warming projections by 2100 [5]

Governments and organizations like the IPCC – a UN body that examines the most advanced sciences of climate change worldwide, are monitoring greenhouse gases, tracking their effects and implementing remedies. Energy-related GHG emissions make for the vast bulk of all anthropogenic emissions, accounting for around 80% in the United States and the European Union, respectively. Electricity accounts for only 20% of total energy use, yet it is responsible for nearly 40% of all energy-related emissions [6]. Carbon dioxide emissions from fossil fuel combustion annually reach over 33 Gt worldwide. About 44% of this comes from coal, 34% from oil, and 21% from natural gas. The power sector accounted for over two-thirds of worldwide emissions increase in 2018, according to the International Energy Agency (IEA), with coal consumption for power production alone creating 10 Gt of CO_2 [6].

Currently, influenced by their development, China and the USA are the greatest GHG emitters (Fig. **3**). They make up more than 40% of the worldwide total emissions.

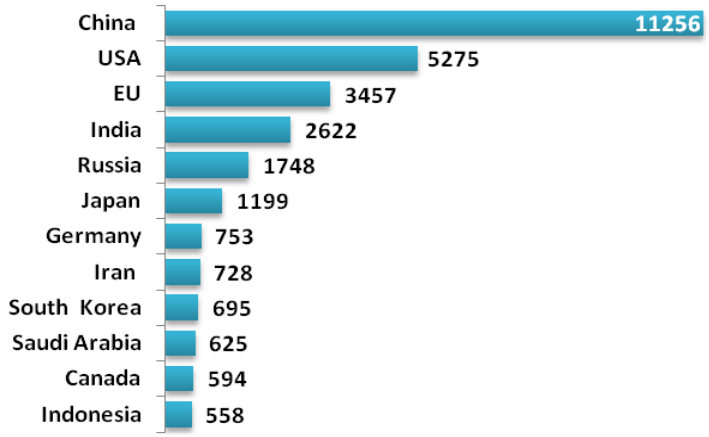

Fig. 3. Top countries as global emitters of CO_2 (Mt/yr) [7]

Every sector of the global economy adds greenhouse emissions to the atmosphere. Research studies put forth that electricity generating sector, burning fossil fuels is the leading sector with the largest share of the GHG emissions. So to avoid the worst effects of climate change, all fossil fuels must be avoided and make a transition to use other resources instead. In 1992, in order to avoid the negative impact of the human activity on climate change for dealing and monitoring the GHG, the UN established UNFCCC which in fact was the first legal international political body. Participating countries to the Third Conference of the Parties (COP) at the UNFCCC in Kyoto, Japan agreed in 1997 for a protocol, known as Kyoto Protocol, for undertaking measures and set targets for the period 2008-2012 for reducing GHG emissions by an average of 5% below 1990 levels, with particular targets specific per each country. This was followed by the Paris Climate Agreement (PCA) of 2015, where countries all around the world accepted this truth to cope with at COP 21 in Paris in December 2015. The most important decision of PCA, which is under the UNFCCC and is mandatory for the signatories, is that by scaling down the emission of GHG to halt the temperature rise and not to exceed 2°C above the average temperature as it was in pre-industrial time. This requires economic and social transformation to face the climate challenges now and moving into the future, based on the best available science. The PCA function in terms of 5 year cycle and countries must submit their Nationally Determined Contributions (NDC) [8]. For the first cycle, i.e. by 2020, countries had to present their (NDC). In NDC countries depict in detail the plan and actions they would take to decrease GHG emissions up to 2025, and their framework of long term

strategies. Countries that have submitted their NDC up to 2030 must present and review their respective implemented measures [8]. The PCA officially took effect on 4.11. 2016, 30 days after the dual entry into force criteria of ratification by at least 55 nations accounting for at least 55 percent of global GHG emissions. Since 5.12. 2016 the accord has been approved by 118 nations, representing 80 percent of worldwide emissions [8].

2 Climate Change Policy of the European Union in Relation to the UNFCCC

As one of the most world's relevant bloc, EU countries have pledged to contribute to reduce GHG emissions and ease the climate change trends. EU set a 2030 framework, which was adopted by EU Council in 2014, and pledged that by 2030 to cut GHG emissions by 40% compared to 1990 levels. Also a key target of this framework is 30% of renewable energy and 32.5% improvement of energy efficiency. The targets of renewables and energy efficiency were revised in 2018.

EU countries as signatories of PCA, by 2020, have been invited to communicate their long-term, low-carbon development strategies for the mid-century. In October 2014, EU leaders agreed on an energy and climate policy framework for the EU for 2030 in order to guarantee that the EU is along a cost-effective path in the line for realizing that long-term goal. They supported a binding EU objective of reducing GHG emissions at least 40% by 2030 in comparison with 1990 [9]. In this regard, European Parliament, in 2019, has approved resolution on climate change and in 2020 the goal of net-zero GHG emissions. Also, in 2019 the EC backed the aim that by 2050 the EU to become climate neutral and presented a long term strategy to the UNFCCC [10]. EU leaders agreed the targets for lowering Europe's GHG emissions between 80% and 95% by 2050, compared with 1990 levels as part of a collectively required decrease by developing nations (IPCC). Another objective for the 2030 are 27% of energy from renewable and 27% for energy efficiency enhancement by 2030 compared with future consumption forecasts, based on present criteria [11]. Each member state has some freedom to adopt its own choice of tools to guarantee that goals are reached in the framework of the Effort Sharing Decision. Nevertheless, each Member State must ensure that the commitments in the context of energy framework of 2030 as discussed above are complied

The progress report of the EU ("Enforcement of the Paris Accord - EU progress towards the 40 percent objectives") reveals that the EU remains firmly on track to achieve its 2020 greenhouse gas emission reduction target. While industrial emissions in the EU have continued to fall, transport emissions have climbed and space heating emissions have increased this year following an exceptionally mild winter [8].

Renewable energy accounted for 19.7% of total energy consumption in the EU in 2019, a slight fall only 0.3 percent below of the 2020 target of 20%. In 2019, the proportion of renewable energy utilized in transport operations in the EU reached 8.9% [12]. Renewables increased to 38% of European power in 2020 (compared to 34.6% in 2019), the first time fossil-fired production was overtaken, which dropped to 37%. This is a significant milestone in the transition to clean energy in Europe. This milestone was first met by Germany and Spain (and by the UK). However, the move from coal to clean remains too sluggish to reduce greenhouse gas emissions by 55% by 2030 and climate neutrality by 2050 [13].

The increase in European renewable energies is driven by wind and solar. Wind power increased by 9% in 2020 while solar power climbed by 15%. In 2020, a fifth of European energy was generated by wind and sun. As bioenergy development halted and hydro output remained constant, wind or solar have delivered all of Europe's

renewable power growth since 2015 [13]. The increase of energy generation from renewables is not satisfactory. In order to achieve the targets on green energy of Europe in 2030, wind and solar production must treble. In figures this means from an average annual increase of 38 TWh, during 2010-2020, to 100 TWh during 2020-2030.

Wind and solar growth in 2020 is optimistic, notwithstanding the impact of Covid-19, by 51 TWh considerably above the 2010-2020 average. Nevertheless, EU nations need to significantly increase their pledges in 2030, for wind and solar energy, as the increase of only 72 TWh per year must reach the aimed goal of 100 TWh [13].

A very promising indicator towards the green energy is the 20% fall from coal generation in 2020, and compared with 2015 is 50% lower. The fall of coal generation came half from lower energy consumption due to pandemic Covid-19, and the other half is due to wind and solar generation. As the demand for power increases in 2021, wind and solar energy will have to increase quicker if the recent coal decline is to continue [13]. This indicates that Europe had 29 percent greener electricity in 2020 compared to 2015. Specific CO2 emission for kWh decreased to 226 gram in 2020, compared 317 gram CO_2 in 2015 [13].

Table 1 presents data of the total installed electrical capacity (in MW) in the EU. During 2000 -2019 there was a rise of 54.5 percent of installed capacities. Combustible fuels (55.5 percent) had the greatest proportion of installed capacity in 2000, followed by hydro (22.0 percent), nuclear (20.4 percent), and wind (2.0 percent), with all others falling below 2.0 percent. Combustible fuels' share of installed capacity fell to 41.9 percent in 2019, while hydro's share fell to 15.9 percent and nuclear's portion fell to 11.6 percent. Wind, on the other hand, raised its contribution to 17.6% and solar photovoltaic to 12.5 percent, while geothermal, tide, wave, and ocean remained insignificant [14].

Table 1. Data for EU's total installed electrical capacity in MW for each electrical source from 2000-2019 **[15]**

	2000	2001	2002	2003	2004	2005	2006	2016	2017	2018	2019
Total capacity	613 221	620 965	634 362	637 307	657 278	675 657	693 041	895 755	907 418	930 757	947 338
Combustible fuels	340 088	342 896	348 549	346 552	359 149	370 324	379 790	401 885	398 249	405 743	396 936
Hydro	134 729	135 058	135 438	135 861	137 713	139 271	139 516	149 838	150 481	150 501	150 912
Pure hydro power	95 932	96 100	96 423	97 127	98 019	98 361	98 168	104 031	104 446	104 643	105 033
Mixed hydro power	18 321	18 346	18 331	18 381	18 758	19 246	19 690	22 804	23 248	23 210	23 231
Pumped hydro power	20 476	20 612	20 684	20 353	20 936	21 665	21 659	23 003	22 787	22 648	22 648
Geothermal	604	587	682	723	658	686	697	841	848	861	866
Wind	12 297	16 845	22 603	27 253	33 156	38 773	45 612	137 998	148 920	157 172	167 140
Solar	175	272	355	588	1 295	2 268	3 224	91 498	96 231	104 062	120 393
Solar thermal	0	0	0	0	0	0	11	2 306	2 306	2 306	2 315
Solar photovoltaic	175	272	355	588	1 295	2 268	3 213	89 192	93 925	101 756	118 077
Tide, wave, ocean	213	215	218	219	218	216	215	225	224	223	219
Nuclear	124 851	124 882	126 297	125 416	124 555	123 142	122 837	112 554	111 524	111 240	109 954
Other sources	263	210	220	695	534	977	1 149	917	942	955	918

3 Kosovo and Green house gas emissions

3.1 Kosovo in the line with the Paris Agreement or lag of implementation in achieving goals

Although not being a member of UNFCCC or Kyoto Protocol, due to its status, the Kosovo Government, like the EU, considers climate change a major issue and is committed to this global issue. On the other hand, Kosovo and 8 other Balkan countries (Albania, Bosnia and Herzegovina, Croatia, Kosovo, Macedonia, Moldova, Montenegro, Serbia and Ukraine) are signatory parties to the Energy Community Treaty (ECT), which is a legally binding treaty between these countries and the EU. The promotion of renewable energy sources and energy efficiency is one of the key aspects of ECT. The ECT also establishes explicit goals for decreasing energy use while increasing demand for renewable energy sources. Article 3 of the Treaty compels the parties to execute the Energy, Environment, Competition and Renewables Acquis Communautaire. In this situation for the environment, it specifies a timeframe for the execution of the priority directives [16].

Kosovo's contribution to global greenhouse gas emissions is practically minimal, according to current statistics, but its willingness to join global efforts to reduce GHG emissions is set as an environmental protection priority. Aspects linked to these changes are incorporated in key environmental laws, such as the Law on Environment, Law on Air Pollution Protection, and Law on Water, in the framework of national legislation on climate change. It also adopted the Climate Change Strategy 2014-2024, which is in line with the EU's planned climate and energy policy framework. Kosovo has produced a greenhouse gas register (inventory) for 2008-2013 as part of its climate change initiatives [17].

Kosovo has established a comprehensive Greenhouse Gas Inventory report (2012) for the first time, which includes all greenhouse gases produced in the country for the period 2008-2009 [18]. The United Nations Development Program and the Czech government also contributed to this initiative. The reporting period was from 2008 to 2009. The following is the outcome of GHG gas emissions for the years 2008-2009: In 2008, total GHG emissions were 9.5 Mt CO2eq; in 2009, they rose to 10.5 Mt CO2eq. Sector "1A Fuel combustion activities," which accounts for roughly 80% of all anthropogenic emissions in Kosovo, is the most significant for the whole inventory. The largest significant source of GHG emissions in Kosovo is solid fuel combustion [17].

The inventory indicated that the energy sectors generated 82 per cent of the GHG emissions, as it was driven by burning of fuels. 13% of the total emissions were generated by Agriculture, Forests and Other Land Use (AFOLU), 3%, were generated from waste, and 2% of total emissions were generated from industrial processes and the usage of products (IPPU) [19].

According to this inventory, and taking into consideration the world: 44003 Mt CO_2eq, expressed in percentage it comes out that Kosovo contributes only with 0.024% of world total emissions.

On 19.2.2019 the Government of the Republic of Kosovo took a decion, which orders MESP, Ministry of Economic Development (MED), Ministry of Trade and Industry (MTI), Ministry of Finance, etc., Kosovo’s municipalities, KEK, for the implementation of the NATIONAL CLIMATE CHANGE STRATEGY 2019-2028/ACTION PLAN ON CLIMATE CHANGE 2019-2020. The reasoning is that this document is an obligation taken in accordance with the Stabilization and Association Agreement (SAA), which is in force since 2016, and the Energy Community Treaty. Here with this document are foreseen all the measures for the protection of the environment, GHG, infrastructure, finances [16]. The Strategy on Climate Change is consistent with the Government of Kosovo's strategic priorities, in

particular the Government Program for the Republic of Kosovo 2017-2021, the National Development Strategy (NDS) for 2016-2021. The development policies of Kosovo during the years 2016-2021 are defined in this NDS. MESP takes measures to include in national legislation the core elements of MEA (Multilateral Environmental Agreements) and to develop the conditions for improved implementation. MEA is part of EU legislation on the environment and climate change, as well as other principles and regulations. Until recently, Kosovo, as part of the endeavor to approximate national legislation to the EU acquis, has transferred a substantial number of MEA principles and regulations. While Kosovo does not participate in or sign the UNFCCC, its obligation as one of the members of the ECT is to meet the criteria. The ECT also establishes explicit energy reduction objectives as long as renewable energy demands rise.

3.2 Climate Change Mitigation Targets and Future Action Plans

Kosovo established in 2013 a National Energy Efficiency Action Plan that sets the residential, transport and service industries energy-efficiency improvements measures and savings objectives for the year 2018 [19]. All statistical tools and methods used in Kosovo to calculate GHG emissions comply with EU directives and guidelines, including the IPCC Guidelines Revision 1996, IPCC 2006 Guidelines for National Greenhouse Gas Inventories, and the UNFCCC [17].

The MESP, with the support of the UNDP in Kosovo, prepared and published in 2014 the Strategy on the Climate Change Framework (CCFS), which helped to identify possible consequences of climate change and mitigation and adaptation strategies. The Strategy became developed in 2014. The CCFS comprised two components: the Low Emission Development Strategy (LEDS) and the National Adaptation Strategy (NAS). Given the great uncertainty about present and planned future emissions of GHGs, the CCFS has difficulty setting quantifiable LEDS emission reductions objectives. Qualitative targets for LEDS were defined as follows: (1) Kosovo will build on capacity to meet its future UNFCCC obligations and be EU member, and (2) Kosovo will slow the emissions increase by increasing energy efficiency across sectors, developing renewable sources of energy, sustainable natural resource utilization, lowering the carbon footprint of products through the recycling of industrial wastes from such products with impact on GHE [20] [21].

Being a member of the European Energy Community, Kosovo implements the EU Directive on Renewable Energy (Directive 2018/2001/EU), which calls on Kosovo to create the National Renewable Energy Action Plan (NREAP) by 2020. The main aspect of NREAP is the goal of increasing the share of renewables in gross energy consumption from 18.25% in 2013 to 29.47% in 2020.

As mentioned above, also in the report of the Kosovo Environmental Protection Agency KEPA, funded by UNDP [22] it is estimated that annual carbon emissions in Kosovo are around 9 Mt of CO_2eq. The energy sector with an 88 percent share of total emissions is the principal producer of greenhouse gases. The trend in total Kosovo gas emissions represents a substantial rise. It is worth noting that in Kosovo, the level of greenhouse gas emissions depends heavily on the quantity of coal energy generated by our country's primary source of GHG. The energy sector comprises around 88%, or 8.42821 Mt CO_2, of the total greenhouse gas emissions of Kosovo . In 2013, around 6.431Mt CO_2 eq was from energy sectors, representing over 76% of emissions [22]. Also KEPA has published a report on the Emission of GHG in Kosovo for the period 2014-2019, with the conclusion that energy sector the main source with a share of 86% in the emission of GHG. Traffic sector follows with 15% share [23].

3.3 Incentives and feed-in tariffs to enhance the Use of Renewable Energy Sources in Kosovo

In order to achieve legally binding targets and to mitigate its GHG emissions, Kosovo has established a statutory framework as well as assistance program through hydropower, wind, solar and biomass feed-in tariffs to stimulate the use of renewable energy sources (RES) [24]. The cost rates for electricity generated from renewable energy sources are: hydro 67.3 €/MWh, wind 85.0 €/MWh, biomass 71.3 €/MWh and solar/photovoltaic panels 136, 4 €/MWh, as stated by the Kosovo Energy Regulatory Office. In defining long-term aims and strategies of the countries, RES will play an essential role in energy generation towards the accomplishment of EU and PCA targets. In this view, this research sheds light on the assessments and use of renewables in Kosovo for the current and anticipated generation of electricity capabilities. Kosovo institutions have scheduled RES capacities and objectives by 2020 to be installed in Kosovo's power supply system with the aim of meeting 20/20/20 following targets: Wind of 150 MW, PV 10 MW, Hydro of 240 MW and Biomass of 14 MW [24]. Despite the legal and legislative framework, promised incentives, the situation of meeting the targets of KPA, and other international, EU protocol, the real situation is not satisfactory. Installed and generating capacities were not within projected targets for 2020. The data on the total installed capacities for generation of electrical power are presented in Table 2.

Table 2. Installed electrical capacities (MW) and generation (GWh) in Kosovo

Type	Installed and operational capacity		Under construction (MW)	2019		2020	
	(MW)	Share (%)		Generation (GWh)	Share (%)	Generation (GWh)	Share (%)
Fossil (TPP)	1042	90	-	5539.16	94.96	6129.48	95.30
Hydro	74.94	6.48	26.36	193.11	3.31	198.02	3.08
Wind	32.40	2.80	104.10	90.53	1.55	91.18	1.42
Solar (PV)	7	0.60		10.39	0.18	13.52	0.21
Biomass	-	-	1.2	-	-	-	-
Total	1156	-		5833	-	6432	-

It is clearly observable the green energy share in Kosovo is extremely low and far from 2030 EU targets and 2050 of PA targets. The worst is that there is no serious plan for a sustainable green energy for the decades ahead to increase the installed capacities of renewables. For achieving the targets the power from coal should come to an end. The units of Kosova A have been planned to be decommissioned due to old age. 185 MW of two units of Kosova A are out of operation and that means 2100 GWh less from the general current production of electricity and that should be compensated with other recourses. Strong evidence that Kosovo should orient its electricity production using renewable sources is the failure to construct then the so called Kosovo e Re thermal power plant with lignite as fuel for not being environmentally friendly, high cost of MWh, conflicts with legislations, environmental and climate protection policies. Contour Global and the World Bank withdrew from financing such TPP with planned installed capacity of 500 MW. From the Table 2 is seen that electricity from TPPs is dominating by the 95% of total generation, whereas the green energy from renewable is only 5%. These parameters of green energy are very low for the fulfillment of PCA and EU targets for the future decades. If Kosovo fails to fulfill its commitment to international and its own national

planed strategies and targets based on laws on protection of environment and reduce its impact on climate change, it will be forced to import green energy with a higher price instead. The economy, more specifically the consumers and taxpayers will pay the bill.

4 Conclusions

Although Kosovo is not a party to the UNFCCC, thus has no legal national obligation under the PCA, it is determined for full implementation of the targets of the respective directives and agreements. Climate change strategy implementation is still at an early level. There is a legal framework, but not a detailed and timing application plan. In this regard, the private sector, either through international donations or private investments is leading towards green energy building capacities. Kosovo electricity generation relies significantly (95%) on coal and does not meet the emission limit laid out in the National Emission Reduction Plan-Kosovo. Administrative capability and sensitization at all levels need to be substantially increased. The Government only contributes with the incentives through the feeding-in tariffs which consequently will affect the increase of energy price in the future through direct payment from consumers or other forms from budget collected through taxation. The strategy and action plan for climate change for 2019-2028 are not implemented adequately. Kosovo, as a signatory to the ECT, with only 5% of green electrical energy has failed to meet its commitment of 25% of energy from renewables by 2020. In the line with this policy for achieving 25% of energy from RES, the following installed capacities were planned and set as targets:

1. Hydro-240 MW
2. Wind-150 MW
3. Solar-10 MW
4. Biomass-14 MW,

but in the end of 2020 the RES installed capacities were only:

1. Hydro-74.94 MW,
2. Wind-32.40 MW
3. Solar-7 MW
4. Biomass-0 MW.

Kosovo's abundance with around 14 Gt of exploitable lignite sources cannot be an asset for future use in electricity generation as it is in contradiction with PCA and other climate protection protocols. That was the reason why the project of Kosova e Re failed due to the withdrawal of funding, and the calculated price was high, 80€/MWh. Due to the fact that Kosovo has no high hydroelectric power potential, largely to topographic factors, the hydro energy is not a promising factor for reaching the targets of PCA.

A positive asset can be from solar energy as estimations show that Kosovo has a solar potential with an annual average of 278 sunny days and 2000 sunny hours. Wind energy, based on the data about the wind potential, would be also a promising solution. Currently, only 32.40 MW are operational and around 105 are expected soon to start generating summing the total wind installed capacity of 137 MW. By these data, it is concluded that perspective of green energy is towards solar and wind energy.

References

1. K. R. Lang, Sun, Earth and Sky, Springer, 2006.
2. Will Elder, "What is Climate Change," 2022. [Online]. Available: https://www.nps.gov/index.htm. [Accessed 7 March 2022].
3. C. C. S. Columbia University, "Carbon dioxide cause global warming," Columbia University, New York, 2019.
4. IPCC, "Summary of Policy Makers," Intergovernmental Panel on Climate Change, Geneva, 2021.
5. CAT, "Warming Projections Global Update," Climate Action Tracker, 2021.
6. WNA, "Carbon Dioxide Emissions from Electricity," World Nuclear Association, London, 2021.
7. EC, "Emission database for global atmospheric research," European Commission, Brussels, 2018.
8. EU-RIPAP, "Regional Implementation of Paris Agreement Project," EU-RIPAP, 2021.
9. Climate Policy Info Hub, "Overview of Climate Targets in Europe," Climate Policy Info Hub, 2021. [Online]. Available: www.climatepolicyinfohub.eu. [Accessed 2021].
10. EU, "Climate strategies & targets: 2050 long-term strategy," EU (European Commission), 2021.
11. EU, "EU Action: Effort sharing 2021-2030: targets and flexibilities," EU, 2021.
12. EUROSTAT, "Renewable energy statistics," EUROSTAT, 2020.
13. Agora Energiewende and Ember, "The European Power Sector in 2020: Up-to-Date Analysis on the Electricity Transition," Agora Energiewende, Berlin, 2021.
14. EUROSTAT, " Electricity and heat statistics," EU, 2021.
15. EUROSTAT, "Maximum electrical capacity, EU, 2000-2019 (MW)," EUROSTAT, 2021.
16. MESP, "National climate change strategy 2019- 2028/ action plan on climate change 2019- 2021," Ministry of Environment and Spatial Planning, Prishtina, 2018.
17. KSA, "Greenhouse Gas Emissions in Kosovo 2014-2015," Kosovo Agency of Statistics, Prishtina, 2016.
18. UNDP Kosovo, "Kosovo greenhouse gas emissions 2008-2009," UNDP Kosovo, 2012.
19. USAID, "Greenhouse Gas Emissions in Kosovo," USAID Prishtina, Prishtina, 2017.
20. M. Qafleshi, D. Kryeziu, L. Bytyçi and F. Kadiu, "Concrete of our Millennium – Eco Friendly Concrete," in *3rd International Conference on Business, Technology and Innovation,7-8 November 2014, Durrës, Albania*, 2014.
21. M. Qafleshi, M. Misini, D. Kryeziu and L. Aliko, "Kosovo fly ash: Utilization in concrete as partial cement substituent and the environmental impact," *Jurnal Teknologi*, vol. 79, no. 2, pp. 73-80, 2017.
22. KEPA, "Kosova Gas Emissions 2008-2013," Kosovo Environmental Protection Agency KEPA, Prishtina, 2015.
23. AMMK, "Emetimi i Gazrave Serrë në Kosovë 2014-2019," Agjencioni per Mbrojtjen e Mjedisit te Kosovës, Prishtina, 2021.
24. ERO, "Decision I: The Feed-in Tariffs for Generation of Electricity from

Renewable Energy Sources," Energy Regulatory Office, Prishtina, 2016.

25. ERO, "Energy Regulatory Office," Energy Regulatory Office, 2016. [Online]. Available: https://www.ero-ks.org/. [Accessed August 2021].