An Empirical Investigation Towards Green Economy in Albania

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Abstract: Green Economy issues have captured the attention of many scientific work in all of the dimensions of the concept and the processes associating it. Empirical evidence is shown on how the government, private sector and the consumer behavior affect the wellbeing toward green transition, what are the opportunities, the challenges, main factors on macro and micro level that indicate the pathways to greening, what is achieved and what can be done better. Even though Albania is not part of the EU, it has benefited from a lot of funds for the transition to a green economy and is part of a series of programs with the green focus and the country has made efforts in this direction. The study investigates the transition process and core principles of green economy. The aim of this paper was to assess the possible interactions of economic and environmental indicators toward green economy. Based on the regression analysis results the authors have shown significant relationship between investments, economic and environmental indicators. A significant positive interaction between investments and CO_2 emissions in Albania was observed. The authors conclude that transitioning towards green economy is not an easy nor a short process and to ensure a fully green recovery, Albania must tackle a set of important challenges.

Keywords: Green economy, green transition, gross capital formation, GHG emissions, pollution, Albania.

INTRODUCTION

The green economy and issues related to it have a wide interest at the global level and require the involvement of a wide group of interests such as governments, organizations, the private sector and also individuals. Many academics have tried to shed more light on this topic by empirically analyzing the interaction of the factors that bring a positive impact on the green economy. The studies mainly show the impact that government measures have on the green economy, the role of entrepreneurs, as well as the behavior of consumers or individuals in the green economy. Green economy offers many opportunities for businesses to be more competitive in the market, but of course the process towards green economy is also accompanied by many challenges. Of course, moving towards a green world is not an easy and not a short process. It requires time, commitment, funding, consistency, and inclusiveness. Albania considers the working towards a "green economy" as fundamental. First, it is clear that the green economy does not replace sustainable development but should be considered as a new path to progress toward it, being instrumental for the reduction of environmental risks and ecological scarcities, as well as to the improvement of human well-being and social equity (Westminster Foundation for Democracy, 2022). Republic of Albania is an active participant in multilateral organizations and agreements. Albania is a signatory Party of the United Nations Framework Convention on Climate Change (UNFCCC) from 1994 and in April 2016 has signed the Paris Agreement (Westminster Foundation for Democracy, 2022). Following the adoption of the 17 Sustainable Development Goals for Albania as a part of the 2030 Agenda for Sustainable Development by world leaders in September 2015, the Government of Albania endorsed this Agenda 2030 on 25 September 2015 (Merko, Balla, & Biancardi, 2023). United Nations Development Programme (UNDP) will assist the country of Albania in the three main areas:

1. Human capital development and social inclusion;
2. Sustainable, Resilient and green economic growth and resource management;
3. Effective people-centered governance, human rights, rule of law and gender equality (UNDP Albania, 2023).

On March 16, 2023, was approved The World Bank Group Programme in Albania which is guided by the Country Partnership Framework (CPF). This strategy supports greener and more resilient and inclusive growth for the Albanian people. It builds on a productive partnership with Albania, focuses on the priorities that are set out in the National Strategy for Development and European Integration and the findings of the World Bank Group's analytical work. The main directions of the CPF are more and better jobs, stronger human capital, and enhanced resilience to shocks. Initiatives to use digitization and improve inclusivity will cross these directions, retaining accession to the European Union (EU) as a long-term goal. The CPF anticipates an estimated program of $900 million, out of which $365 million

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was approved for four new projects. These four projects include:

- Building Resilient Bridges (\$100 million), which will aim to enhance resilience to climate change and natural hazards of Albania's critical bridge infrastructure, and to improve road and bridge asset management
- Climate Resilience and Agriculture Development (\$70 million), which aims to increase competitiveness and resilience of priority agri-food value chains
- Improving Equitable Access to High Standard Public Services (\$65 million), which aims to improve service delivery quality and significantly increase the use of new technologies in the public sector
- First Resilience and Green Development (\$120 million), (World Bank, 2023).

Taking into consideration the effort that Albania is doing towards green economy and the importance of green economy itself, this paper was an attempt to explore and empirically analyze the potential effects and interactions between economic and environmental indicators. Historical data showing the link between gross capital formation, macroeconomic GDP indicators, labor force participation and ecological indicators (CO_2, CH_4, HFC_s and NO_x) were used to create an empirical investigation. The authors have shown significant relationship between variables as stated and detailed in the following sessions.

LITERATURE REVIEW

The term Green Economy first appeared in 1989 in a Report from the London Environmental Economics Centre (Bogovic & Grdic, 2020). In 2012, the United Nations Environment Programme (UNEP), the World Bank and Organization for Economic Co-operation and Development (OECD) organized the Rio+20 Conference where they advocated for the necessity of a green economy as a new approach across world economies (Batrancea, Pop, Rathnaswamy, Batrances, & Rus, 2021). A green economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcity. The most widely used and internationally recognized definition of green economy is that of UNEP. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive (UNEP, 2010). A green economy aims to reduce the use of electricity, the emission of pollutants, encourage the use of renewable energy sources, or the scaling of positive processes, thus contributing to making our global economy much more sustainable, healthier, and greener (MET Group, 2022). Green Economy aims to achieve macroeconomic growth while simultaneously ensuring development in the form of employment, reduction in national and regional inequalities, increase of the standard of life and the health of both people and the environment (Bogovic & Grdic, 2020). According to the OECD 2011, green means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies (OECD Green Gowth Studies, 2011). The definition clearly underscores that green policies do not need to slow economic growth and puts human development at the center. Emerging evidence and more hypothetical analysis suggests that Green Growth can lead to poverty reduction, economic growth, reduced vulnerability to climate change and natural disasters, greater energy security, and more secure livelihoods for those directly dependent on the use of natural resources (Scott, McFarland, & Seth, 2013). Creating a green economy and to achieve meaningful change the more significant economic players, companies, countries, and international organizations must take action, but, individual contributions can also be an enormous help (MET Group, 2022). In response to the need to reduce the negative environmental impact, a slew of "Green Initiatives" has emerged from the Government, Business organizations, Educational Institutions, Non-Governmental Organizations (NGO's) etc. It was practiced earlier in western countries but now spreading to other parts of the world. From the basics of "Reduce, Reuse, Recycle" to use of renewable sources of energy such as solar, wind etc. according to the nature of the region to construction of Leadership in Energy and Environmental Design (LEED) certified, the so–called "Green Buildings", the initiatives fall in a wide spectrum (Promod & Ramachandran, 2019). The model of restructuring economic activities to the specificity of a green economy addresses the interdependent pillars of sustainable development: environmental concerns; renewable energy; low carbon levels (Batrancea, Pop, Rathnaswamy, Batrances, & Rus, 2021). According to the Kyoto Protocol, programmes with climate change focus, would concern the energy, transport, industry sectors as well as agriculture, forestry and waste management. Furthermore, adaptation technologies and methods for improving spatial planning would improve adaptation to climate change (United Nations, 1998). In Europe, the Emissions Trading System (ETS), also known as the carbon dioxide quota, was created in connection with the Kyoto Protocol. It can be considered effective, but it is by no means a perfect system for controlling climate change. The European Union is the third largest carbon dioxide emitter in the world. At the same time, the EU is doing the most to change this and reverse harmful natural processes. The ETS was created in 2005 for this purpose, initially on a test basis and then in full from 2008 (EU Emissions Trading System, 2022). The revised ETS Directive entered into force on 8 April 2018 and sets the framework for the fourth trading period from 2021 to 2030 including the intermediate target of an at least 55% net reduction in greenhouse gas emissions by 2030 (Association of European Energy Exchanges, 2023). Under the Paris Agreement, its overarching goal by 2030 (compared to the 1990s) is to hold "the increase in the global average temperature to well below 2°C above pre-industrial levels" and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels" (United Nations, 2023). An inclusive Green Economy is a thriving economy that delivers the linked economic, social and environmental outcomes sought by the Sustainable Development Goals (SDG) and the Paris Agreement. It follows five key principles: the wellbeing principle, the justice principle, the planetary boundaries principle, the efficiency and sufficiency principle and the good governance principle. The whole process couldn't be recognized without priorities in order to accelerate economic transformation and pathways (Partners for Inclusive Green

Eonomies, 2019). Currently, the challenges for world economies are threefold: Controlling climate change; eradicating poverty and advancing sustainable development goals (Batrancea, Pop, Rathnaswamy, Batrances, & Rus, 2021). The green economy has the potential to achieve what sustainable development cannot and can in some way address the limits of traditional economic growth (Zhu, Zhang, Kanhalikham, Liu, & Shen, 2023). A large number of authors have researched how investments will impact GDP and employment but the impact of investments on environmental indicators has not been sufficiently explored (Bogovic & Grdic, 2020). Stoimenova studied the consumption behavior in Bulgaria and revealed that Bulgarians are moderately knowledgeable about the environment problems and the depth of knowledge is moderate as well. The environmental knowledge differs between different demographic groups: the better educated, younger, those living in the cities and wealthier people have better self-reported knowledge about the environmental problems. The results of the research to some extent confirm the common conclusions that people are more interested in the problems that could affect them personally and directly (Stoimenova, 2016). The study of Kamasak, Yozgat and Yavuz stresses the importance of the leadership. They revealed that leadership activities contributed more than government policies on the adoption of green management practices of the firms. In this sense, the impact of leadership on the way of implementing the green related issues can be more than that of the governmental policies. When the two variables act together, firms can adopt green management practices much easier and effectively (Kamasak, Yozgat, & Yavuz, 2016). Bogovic and Grdic proved the positive link between investment values, GDP and employment trends in Croatia, as well as between Sulphur, CO_2 and NO_x emissions (Bogovic & Grdic, 2020). Saidi and Omri used both growth and environmental functions to demonstrate the effectiveness of renewable energy in promoting economic growth and mitigating carbon emissions. They showed the efficiency of renewable energy in increasing economic growth and reducing carbon emissions (Saidi & Omri, 2020). A study from China investigated the role of natural resources rent, green investment, financial development and energy consumption in mitigation of carbon emissions to achieve sustainable development goal of a clean environment. The authors proved that green investment is negatively linked to CO_2, whereas national natural resources rent is positively associated with carbon emissions. This study recommends strengthening of national natural tax law, promotion of green investment and environmental-friendly policies to control carbon emissions (Shen, et al., 2021). Alola, Bekun and Sarkodi investigated the drivers that reduce greenhouse gas (GHG) emissions in EU member countries. They found that 1% increase in real GDP increases environmental quality by 0.81% in the long-run. Renewable energy consumption was found to improve environmental sustainability and diversification of the energy mix with renewables is essential to reducing pollution (Alola, Bekun, & Sarkodie, 2019).

Shahbaz, Lorente and Sinha examined the association between foreign direct investment (FDI) and carbon emissions for the Middle East and North African region in 1990–2015, including biomass energy consumption as an additional determinant of carbon emissions. They found that biomass energy use lowers carbon emissions, and the causality analysis reveals that FDI causes CO_2 emissions. The results confirm the existence of a feedback effect between economic growth and carbon emissions. The empirical findings suggest policy makers to design comprehensive trade and energy policies by targeting the cleaner production practices, for not only to ensure environmental sustainability, but also to fulfil the objectives of sustainable development goals (Shahbaz, Balsolobre-Lorente, & Sinha, 2019). Bekun, Alola and Sarkodie investigated the long-run and causal interaction between, renewable energy consumption, nonrenewable energy consumption, and economic growth in a carbon function for selected EU-16 countries. They found cointegration between carbon dioxide emissions, economic growth, natural resources rent, renewable, and nonrenewable energy consumption. Their study affirmed that nonrenewable energy consumption and economic growth increase carbon emission flaring while renewable energy consumption declines CO_2 emissions (Bekun, Alola, & Sarkodie, 2019).

MATERIALS AND METHODS

For the purpose of the research outlined in this paper, the authors used annual data for the following variables:

Economic indicators

- Labor force, (as the total number of employed people)
- GDP, (current US$)
- Gross capital formation, (current US$)

Environmental indicators

- CO_2 per year (kilo tons)
- CH_4 per year (kilo tons of CO_2 equivalent)
- NOx per year (thousand metric tons of CO_2 equivalent)
- HFCs per year (thousand metric tons of CO_2 equivalent)

These variables were analyzed in Albania for the period from 1990 to 2022. The indicators were drawn from the World Bank Data Indicators. It wasn't possible to gain full data for the HFCs variable because the latest value date from 2010 and there are missing values during the 1990-2010 period too. For this reason we used only some descriptive statistics and charts to show the trend of this variable.

The statistical analyses were conducted using both the IBM SPSS Statistics 26 version and EViews 12 version. Apart from basic descriptive statistics, the authors also performed correlation and regression analyses. Based on the research interest, the following two hypotheses were raised:

Hypotheses 1 (H1): size of gross capital formation affects GDP and employment.

Hypotheses 2 (H2): size of gross capital formation affects environmental indicators.

Based on the research hypotheses, an econometric model was obtained where the size of gross capital formation was defined as an independent variable, while dependent varia-

Table 1. Descriptive statistics of variables.

		Labor Force	GDP	Gross Capital Formation	CO_2	CH_4	NO_x
N	Valid	33	33	32	31	31	31
	Missing	0	0	1	2	2	2
Mean		1332735.88	8469594520.75	2287907781.03	3881.9548	3362.0815	1198.2617
Std. Deviation		63680.542	5570503291.557	1527585026.40	1245.7409	347.46505	102.87038

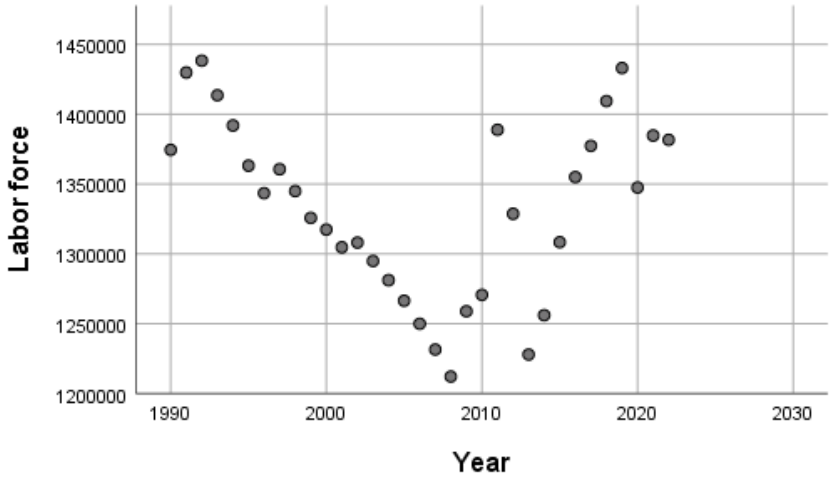

Fig. (1). Employment history in Albania during 1990-2022.
Source: performed by authors with data from World Bank.

bles included the labor force, GDP, CO_2, CH_4 and NO_x. The first part of the statistical analysis defined the Pearson correlation between the stated variables, and the second part used the following log-log regression:

$$logy_i = \alpha + \beta\, logx_i \quad (1)$$

Where y_i is one of the stated dependent variables and x_i is the independent variable.

RESULTS

This paragraph outlines the results obtained through the conducted analysis. The statistical analysis of variables in the model was conducted first and is shown in Table **1**.

The data shows that the mean value of the total number of employed people is 1.33 (million). The analyzed data shows that the number of employees in Albania for the period 1990-2022 fluctuates up and down, but the range of fluctuations is not deep. It is observed a slight increase in the number of employees from 90'- 93' which corresponds to the overthrow of the dictatorial regime in Albania and the installation of democracy. While a decrease in the number of employees is observed for the period 1993-2008. The overthrow of the dictatorial regime also brought the closure of some factories and plants, which affected employment. Also, during the period of the democratic transition and the opening of the borders, a considerable number of Albanians emigrated outside Albania. It seems like the 2008 global crisis didn't affect the employment in Albania as the observed period 2008-2012 is associated with an increase after almost 15 years of decrease. The data shows decrease again in 2012-2014 and an increase in 2014-2019. The highest number of employees in Albania during the hole 1990-2022 period is in 2018-2019 with 1.40 - 1.43 (million) people employed. In the 2022 the number of employees corresponds to 1.38 (million). As a final note on employment, 2009 was an election year for Albania and Albania is a country that is also affected by election periods and this can explain part of the fluctuations in the employment history in our country. Emigration has also played an important role and during the last years the number of people emigrating abroad has increased. Fig. (**1**) shows the employment history during 1990-2022 period in Albania.

When looking at GDP we can see that its mean value is around 8.469 billion dollar. The overall performance of GDP has a positive trend during the years with some fluctuations in the middle, first arising during the overthrow of the dictatorial regime reflecting a decrease from 90'- 92'. The years 97'- 98' bring another decline in GDP, which can be explained as a consequence of the political instability that Albania had that time and the pyramid schemes. Another decline was also observed in 2010 and then in 2015 and 2016. After this period, GDP has increased, reaching its highest values in 2021 and 2022 with around 18 and 19 billion dollar by years. In a similar way to the GDP, the years 90' – 92' show a decline for the gross capital formation. The mean value of gross capital formation executed is 2.28 billion dollar and the highest value was achieved in 2008 after which investments began to drop. After 2017 they experienced an increase, achieving its second highest value in 2021 with

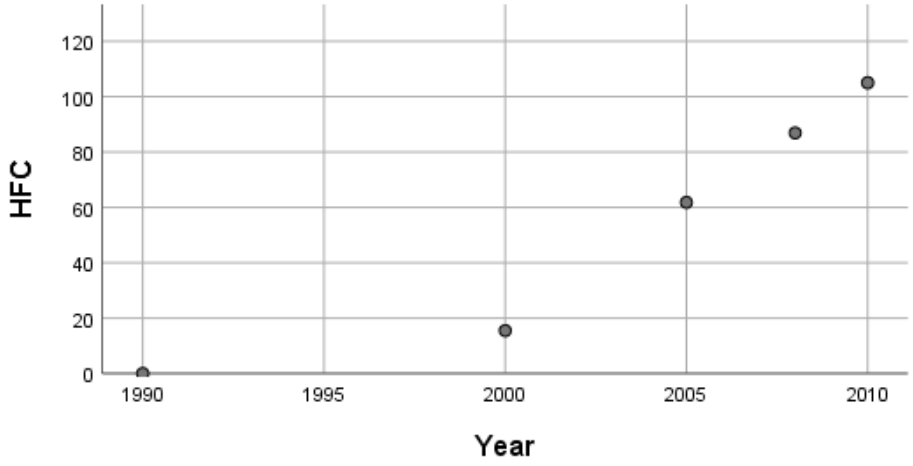

Fig. (2). HFCs emissions in Albania during 1990-2010.

4.44 billion comparing to 4.6 billion in 2008. Regarding environmental variables the data show a mean of 3881.95 kt of CO_2. From 1990-2003, a significant decrease in carbon dioxide emissions is observed, below the mean value. From 2004-2020 there is an increase in CO_2 emissions above the average emission with approximately 1000 kt above mean value. The mean value of CH_4 is 3362.08 (kilo tons of CO_2 equivalent). It is interesting how methane emissions declined till 2007 but still its values are above the mean value of 3362. From 2007-2020 CH_4 emissions have been below the mean value with a decreasing trend. The mean value of NO_X equals 1198.26 (thousand metric tons of CO_2 equivalent). Its emissions have been declining below the mean value starting in 2008, reaching its lowest value in 2020 (latest value), 1015.19 (thousand metric tons of CO_2 equivalent). Until 2008, its emissions fluctuated up and down around the mean value. Regarding the emissions of HFCs, the data have been limited. During the period 1990-2010, there are only five values available from the World Bank and an increasing trend is observed (Fig. **2**). Due to the lack of data, we will not include this variable in the following analytic analysis.

In order to determine the relationship between gross capital formation and both, economic and environmental indicators, a correlation analyses was conducted and the Pearson coefficient was calculated (Table **2**).

Table 2. Pearson coefficient for gross capital formation and other variables

Indicator	Correlation Coefficient	Significance
GDP	0.969	0.000
Labor Force	-0.558	0.001
CO_2	0.688	0.000
CH_4	-0.615	0.000
NO_x	-0.158	0.396

GDP and CO_2 show a positive link with gross capital formation and the strongest relationship according Pearson correlation coefficient. The weakest relationship is observed between NO_x and gross capital formation and it is the only insignificant relationship. The results show that increasing gross capital formation is statistically significantly connected with an increase in pollution when it comes to carbon dioxide, which is the main greenhouse gas contributor in Albania, but not when it comes to methane and nitrogen oxides.

In Table **3** is shown results from univariate regression log-log analysis, ADF test and cointegration.

Before running the regression, stationarity was tested under the null hypothesis that variables contain a unit root. Augmented Dickey Fuller test show that all variables contain a unit root, NO_x makes an exception. Since the variables are not stationary, it is necessary to test the cointegration to avoid the occurrence of spurious regression. Johansen procedure was performed in this case. In all cases, it was possible to find cointegration, except for the relationship between gross capital formation and labor force participation. The analysis conducted shows that raising investments by 1% on average leads to an increase of GDP by 0.71% and CO_2 emissions by 0.21%. While an increase in investments by 1% on average leads to a decrease of labor force by 0.02%, CH_4 by 0.05% and NO_x by 0.01%. According to National Greenhouse Gas Inventory Report under the Albania's First Biennial Update Report, for the years 2009-2016, CO_2 is the most significant GHG in Albania, followed by CH_4 and in a small percentage by indirect N_20 emissions form the atmospheric deposition of nitrogen in NO_x and NH_3, N_20 (2%). Based on the results of the analyses it can be concluded that both research hypothesis have been confirmed. An increase in the level of investments results in highly positive trends regarding the GDP, but the investments also affect environmental indicators. The analysis showed that the rise in investments has a negative impact on the environment, i.e., that greenhouse gas emissions of carbon dioxide are increased as well excluding methane and nitrogen oxides. Regarding the relationship between employment and investments, results do not support the long run relationship cointegration and authors ran a VAR model with one lag in order to observe the relationship in the short run. The Granger Causality procedure show that investments do not affect employment (Chi-square 0.041 and probability 0.8391), concluding thus that maybe investments do contribute more on

Table 3. Univariate regression log-log analysis, ADF and cointegration

Indicator	Regression Coefficient	R^2	p	ADF	p	Maximum Eigenvalue	p
GDP	0.712	0.938	0.000	-0.679	0.8380	14.26	0.046
Labor force	-0.021	0.314	0.000	-1.94	0.3105	14.26	0.123
CO_2	0.210	0.476	0.000	-1.267	0.631	14.26	0.001
CH_4	-0.050	0.378	0.000	-0.064	0.955	14.26	0.000
NO_X	-0.010	0.031	0.333	-4.304	0.002	14.26	0.004

capital formation but this issue is beyond the objective of this paper.

DISCUSSION AND CONCLUSIONS

This research adopted the Croatian research design of Bogovic and Grdic and proved the link between gross capital formation, economic indicators and environmental indicators in Albania. This paper has also proven similar research results by other authors, as presented in the paragraph with the literature review.

In the Economic context, economic growth in Albania is too low to converge with European Union living standards and achieve the Sustainable Development Goals (UNDP Albania, 2023). The most recent data indicate that the economy showed resilience despite the international turmoil with 4.8% GDP growth in 2022 and 3% expectations for 2023, due to contribution of tourism, domestic consumption and construction sectors. Public expenditures (as percentage of GDP) reached 30.5% in 2022, a slight decrease from 32.1% in 2021, and public revenues (percentage of GDP) decreased to 26,8 % from 27.5% in 2021.With regards to unemployment rates, Albania saw improvements in 2022 with an average of around 11 % compared to 12 % both in 2021 and 2019 (for the age group 15-64). Unemployment rate continued around 11 % during the first quarter of 2023 and Albania and Montenegro are the only countries in the region where employment levels continued to grow in 2022. Inclusion of vulnerable people in the labor market remains a challenge with more than half of the poor population inactive, unemployed, nor in education, and people living in remote areas often completely excluded. Women's labor participation for the 15-64 age group is lower by 15.9% points compared to men's labor participation. In addition, the gender pay gap in 2022 was 4.5%, lower by 2% compared to the level of 2021 (6.6%) and this does not account for women involved in informal work. In general, access to employment opportunities continues to be constrained by gender roles and patriarchal norms. The gender disparity in unpaid work is stark in Albania, where women devote 21.74% of their daily time to unpaid tasks like cooking, cleaning, and childcare, while men contribute just 3.47%. The overall improved outlook may still face uncertainties due to several factors, including inflation, an escalation of Russia's war in Ukraine and unfavorable weather impacting electricity production (UN Joint Programme Leave No One Behind , 2023). In the Albanian path towards modernization and a free market economy, the environment has been the least important aspect of the nation's development, causing a considerable burden to today's generation to buy their future "health insurance". The main problems include air and water pollution (mainly caused by production processes, combustion plants, domestic heating, commercial and residential construction and the increasing number of old vehicles in urban centers), poor waste management infrastructure, and deforestation. According to the Global Innovation Index 2022, Albania ranks 84th out of 132 countries where innovation has been measured at 39th in Europe (almost at the end of countries), that means that the concept is almost unknown in developing economies, such as Albania. World Bank reported low GHG emissions in Albania in 2022 relative to regional peers because nearly all of Albania's electricity production is generated by hydropower, and there is limited heavy manufacturing. However, road traffic, inefficient heating systems (including burning firewood and outdated boilers), and agricultural activity are all significant GHG contributors that need to be tackled (Merko, Balla, & Biancardi, 2023).

In the Environment context, environment protection is one of 127 programs funded by the Albania state budget and budget allocated for it is very low. In the last 4 years (2019-2022), the budget has been 0.23-0.18% of the total budget of the government, much lower value than other countries of the Balkan. Albania has set a target to reduce GHG emissions through an inclusive process (Westminster Foundation for Democracy, 2022). Main greenhouse gases causing pollution in Albania are CO_2, CH_4, N_2O and HFCs (Kamberi, Islami, Diku, Profka, & Selfo, 2021). In its enhanced Nationally Determined Contributions (NDC) under the Paris Agreement, Albania committed to reduce GHG emissions by 20.9% by 2030 compared with business as usual. In its first NDCs, Albania had committed to reduce CO_2 emissions by 11.5% between 2016 and 2030 compared with the baseline scenario (OECD, 2022). Albania has the lowest per-capita carbon dioxide (CO_2) emissions in the Western Balkan region and in Europe. In 2018, its per-capita CO_2 emissions were only 1.5t CO_2, against a regional average of 4.4t and an EU average of 6.1. In relation to economic output, however, Albania's GHG emissions (0.27t CO_2 per unit of GDP [2015 USD]) remain above the EU average (0.16 t CO2 per unit of GDP). Albania performs well in terms of energy efficiency and GHG emissions because it relies almost entirely on hydropower for electricity generation but lacks a GHG monitoring, reporting and verification mechanism (Westminster Foundation for Democracy, 2022) (OECD, 2022). Regarding recycling, due to the delayed development of a national legal framework for integrated waste management, Albanian producers are not incentivized to decrease waste at the source. In addition, municipalities often lack the organizational ca-

pacity to ensure recycled waste collection and companies deem current government incentives and subsidies not up to the task. Albania's future access to the EU market and the preparation to the higher competition that Albanian companies will encounter provide strong incentives both for the private and public sector to increase the pace of their work towards sustainability (UNDP Albania, 2023). Albania is rich in natural resources but the country is impacted from extreme weather such as: flooding, prolonged drought, erosion, etc., and one of the most vulnerable countries in the region regarding climate change. In the last two decades there is an increase in temperature, decrease of precipitation and a more frequent display of the extreme weather phenomena. The most vulnerable sectors are agriculture and energy. (Westminster Foundation for Democracy, 2022).

One of the key issues that needs to be addressed in Albania is the high energy consumption in residential and public buildings. In 2019, the residential sector accounted for 24% of final energy consumption in Albania; in 2018, this sector accounted for 53% of electricity consumption. At present, solar and wind energy account for only 2% of residential energy consumption. For space heating, Albania relies mainly on electricity (45.8%), fuel wood (35%) and oil products (19.3%), with liquefied petroleum gas (LPG) holding the major share of the latter. Many Albanian homes are only partially heated – meaning for just a few hours per day. Continued reliance on traditional biomass burnt in outdated woodstoves results in numerous environmental and health problems. According to Albania's residential and public building typologies, all residential and public buildings constructed prior to 2010 completely lack insulation. Albania requires a financing framework and a strategy to raise sufficient financial resources for energy efficiency improvements in buildings. An estimated EUR 2.3 to 2.7 billion is needed for energy efficiency improvements in Albania's building sector until 2030.

Air pollution in Albania is lower than in other Western Balkan economies, but remains a challenge in comparison to international benchmarks. While the World Health Organization (WHO) recommends a maximum annual average PM2.5 air pollution of 10 $\mu g/m^3$ the average in Albania was 18.6 $\mu g/m^3$ in 2017, compared with 25.8 $\mu g/m^3$ in the Western Balkan region and only 12.5 $\mu g/m^3$ in the European Union. Among 41 European countries, Albania ranks third (after Kosovo and Serbia) in terms of years of life lost per 100 000 inhabitants due to PM2.5 air pollution[1]. Sources of air pollution in Albania include oil and gas extraction, inefficient technologies for household heating, cement production, and vehicle emissions (transport). Transport is the main contributor to air pollution in Tirana (OECD, 2022).

The use of solar power is more widespread in Albania than in other Western Balkan economies but remains limited. In 2019, photovoltaic (PV) solar power generated 0.4% of electricity in Albania compared with 0.2% on average across the region. In 2018, solar thermal energy accounted for 0.6% of final energy consumption in Albania (against 0.1% on average in the region) and for 1.6% of residential energy consumption (against 0.1% in the region). Solar thermal energy amounted to 2.4% of commercial and public energy consumption in Albania compared with 0.6% as the regional average.

Albania's transport sector is very energy-intensive and polluting. In 2019, this sector accounted for 40.7% of final energy consumption – the highest share in the Western Balkan region and above the EU average (31.3%). In 2005, Albania's transport sector accounted for 23.5% of total GHG emissions, with data showing a rising trend to 25.5% in 2009 (latest data available). At 97.5%, road transport accounts for, by far, the largest share of transport GHG emissions (OECD, 2022).

Eight policy priorities have great potential to ensure a green recovery in Albania, with energy efficiency improvements in buildings being the first-order priority (OECD, 2022).

- Set incentives and create enabling conditions for energy efficiency improvements in buildings
- Complete legal and institutional frameworks for energy efficiency in buildings, and fully implement existing legislation
- Prioritize implementation of energy and climate policies
- Improve monitoring of air quality
- Finalize and fully operationalize policy and support frameworks for renewables
- Create the enabling conditions for investment in renewables
- Improve monitoring, planning and environmental standards for Small Hydropower Plants (SHPP), and re-evaluate remaining subsidies for SHPPs
- Improve, modernize and decarbonize the transport system.

After weathering the consequences of the 2019 earthquake, COVID-19 pandemic, and price crisis, the government's focus is now on full recovery with special attention on tourism, agriculture, and digitization. It is encouraging to see that there is increased attention to climate change and the environmentally-friendly interventions across economic sectors (World Bank, 2023).

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Association of European Energy Exchanges. (2023). *EU Emissions Trading System Directive (EU ETS)*. Retrieved from Europex Web Site: https://www.europex.org/eulegislation/eu-ets-directive/

Alola, A. A., Bekun, F. V., & Sarkodie, S. A. (2019). Dynamic impact of trade policy, economic growth, fertility rate, renewable and non-renewable energy consumption on ecological footprint in Europe. *Science of the Total Environment*, 702-709.

[1] This estimation is based on 2016 data, since Albania has not submitted more recent data to the EEA on time, due to a lack of functional air quality monitoring.

Batrancea, L., Pop, M. C., Rathnaswamy, M. M., Batrances, I., & Rus, M.-J. (2021). An empirical investigation on the transition process toward a Green Economy. *MDPI*.

Bekun, F. V., Alola, A. A., & Sarkodie, S. A. (2019). Toward a sustainable environment: Nexus between CO2 emissions, resource rent, renewable and nonrenewable energy in 16-EU countries. *Science of the Total Environment*, 1023-1029.

Bogovic, N. D., & Grdic, Z. S. (2020). Transitioning to a Green Economy - Possible Effects on the Croatian Economy. *MDPI Journal Sustainability*.

EU Emissions Trading System. (2022, November 30). *MET Group*. Retrieved from MET Group Web Site: https://group.met.com/en/mind-the-fyouture/mindthefyouture/eu-emissions-trading-system-eu-ets

Kamasak, R., Yozgat, U., & Yavuz, M. (2016). Government Policies, Implementation Leadership and Green Management Practices in an Emerging Economy. *International Journal of Trade, Economics and Finance*, 97-101.

Kamberi, M., Islami, B., Diku, A., Profka, D., & Selfo, G. (2021). *National Greenhouse Gas Inventory Report under the Albania's First Biennial Update Report to UNFCCC.* Tirana: Ministry of Tourism and Environment.

Merko, F., Balla, A., & Biancardi, M. (2023). Building a sustainable growth model toward a green economy in Albania. *UNICARTradEconomy & Finance International Conference* (pp. 227-236). Cosenza (Italy): University of Calabria.

MET Group. (2022, December 29). *Green Economy: meaning and examples*. Retrieved from MET Group Web Site: https://group.met.com/en/mind-the-fyouture/mindthefyouture/green-economy

OECD. (2022). *Multi-dimensional review of the Western Balkans: From analysis to Action.* Paris: OECD Development Pathways, OECD Publishing.

OECD Green Gowth Studies. (2011). *Towards Green Growth.* Paris: OECD Publishing.

Partners for Inclusive Green Eonomies. (2019, July 16). *Principles, priorities and pathways for inclusive green economies: Economic transformation to deliver the SDGs.* Retrieved from Green Economy Coalition Web Site: https://www.greeneconomycoalition.org/assets/reports/GEC-Reports/Principles-priorities-pathways-inclusive-green-economies-web.pdf

Promod, P. V., & Ramachandran, R. (2019). Ecopreneurship: A step towards going green. *Research Review International Journal of Multidisciplinary*.

Saidi, K., & Omri, A. (2020). The impact of renewable energy on carbon emissions and economic growth in 15 major renweable energy-consuming countries. *Environmental Research*, Vol 186.

Scott, A., McFarland, W., & Seth, P. (2013). *Research and Evidence on Green Growth.* Overseas Development Institute for Evidence on Demand and UK Department for International Development.

Shahbaz, M., Balsolobre-Lorente, D., & Sinha, A. (2019). Foreign direct Investment–CO2 emissions nexus in Middle East and North African countries: Importance of biomass energy consumption. *Journal of Cleaner Production*, 603-614.

Shen, Y., Su, Z.-W., Malik, M. Y., Umar, M., Khan, Z., & Khan, M. (2021). Does green investment, financial development and natural resources rent limit carbon emissions? A provincial panel analysis of China. *Science of the Total Environment*, Vol 755, Part 2.

Stoimenova, B. (2016). Knowledge and attitudes about green consumption in Bulgaria. *Economic Themes*, 499-515.

UN Joint Programme Leave No One Behind . (2023). *Annual Progress Report August 2022 - June 2023* . Tirana: United Nations House.

UNDP Albania. (2023). *Sustainable Packaging: an opportunity for the development of Albanian companies*. Retrieved from UNDP Web Site: https://www.undp.org/albania/news/sustainable-packaging-opportunity-development-albanian-companies

UNDP Albania. (2023). *Sustainable resilient and green economic growth and resource management*. Retrieved from UNDP Web Site: https://www.undp.org/albania/sustainable-resilient-and-green-economic-growth-and-resource-management

UNDP Albania. (2023). *UNDP Albania: About us*. Retrieved from UNDP Web Site: https://www.undp.org/albania/about-us

UNEP. (2010). *Green Economy Reports: A preview.* Saint Martin Bellevue: UNEP.

United Nations. (1998). *Kyoto Protocol to the United Nations Framework. Convention on Climate Change.* Retrieved from United Nations Web Site: https://unfccc.int/kyoto_protocol

United Nations. (2023). *The Paris Agreement. UNFCCC.* Retrieved from United Nations Climate Change Web Site: https://unfccc.int/process-and-meetings/the-paris-agreement

Westminster Foundation for Democracy. (2022, August). *Green Budgeting in Albania*. Tirana: WFD Limited; Milieukontakt Albania; Studio D – Development and Dialog; UK Government.

World Bank. (2023, October 10). *Albania Overview: Development news, research, data*. Retrieved from World Bank Web site: https://www.worldbank.org/en/country/albania/overview#2

World Bank. (2023, October 10). *Albania Overview: Development news, research, data*. Retrieved from World Bank Web Site: https://www.worldbank.org/en/country/albania/overview

Zhu, J. J., Zhang, R., Kanhalikham, K., Liu, Z., & Shen, X. (2023, June 26). *Green economy studies amongst the global climate change challenge between 2016 and 2022: a bibliometric review.* Retrieved from Frontiersin Web Site: https://www.frontiersin.org/articles/10.3389/fevo.2023.1168437/full

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