

# Regional Aspects and Development Opportunities in Bulgaria in the Context of the European Green Deal

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This article is devoted to the problems and challenges in the implementation of policies for socio-economic transformation of regions in Bulgaria about the European Green Deal. The conceptual change at the European level necessitates the definition of new priorities for the Bulgarian state in its path towards a more equitable transition to a green economy. The main objective of the authors is to analyze and assess the development opportunities and challenges for the Bulgarian economy on the path to a green and equitable transition. The authors examine the economic changes in the Bulgarian regions. The paper defines the methodology of the scientific approach to such research, using the system, network, geographical, cartographic, and comparative methods. The paper outlines the necessity of introducing smart systems at the city and region levels to manage the territory and its development more effectively. Special attention is paid to energy problems and the need for energy transformation in countries like Bulgaria. In addition, the need to strengthen cross-border cooperation in the Balkan region to build integrated models in different sectors and industries to make the transition to a new type of socio-economic development more sustainable and equitable is also recognized.

**KEYWORDS:** fair transition, governance, system, models, regional development, economy, smart systems, information.

In 2021, the European Union (EU) embarked on a new course of development that imposes profound socio-economic changes on member states. The widely touted deal is a response to deepening global climate changes. At the heart of the ambitious plan is the overarching goal of achieving a climate-neutral European economy by 2050. The Green Deal, therefore, necessitates talking about a just transition to a neutral European economy, and the financial and regulatory aspects of the transformation are linked to this circumstance (Sikora, 2021). The EU must therefore make a new technological leap based on a just transition. Therefore, based on the climate neutrality strategy, the EU will propose long-term policies for a just transition that have their regional specificities. In this sense, the Green Deal can be defined as a roadmap for the implementation of key policies to achieve climate neutrality (SIDDI, 2020). There are different European practices to implement a green transition. Green transformation can be defined as combining economic growth with caring about the environment to guarantee a high quality of life for present and future generations at the level which is attainable due to civilizational development, as well as to effective and rational use of the available resources (Cheba, Bąk, Szopik-Depczyńska, loppolo, 2022). The deal's four pillars would be carbon pricing, sustainable investment, industrial

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## Abstract

## Introduction



policy, and a just transition (Claeys, Tagliapietra, Zachmann, 2019). About securing funding to implement reforms in the context of the Green Deal, the European Commission has established a European Recovery Fund. A major part of it is related to the energy transition and the construction of photovoltaic, wind, and geothermal power plants. By 2030, 21-22 GW of PV is needed annually in the EU to reduce emissions by 55% (Kougias, Taylor, Kakoulaki, Jäger-Waldau, 2021).

A just transition cannot happen without the necessary digital and software tools (platforms) to manage territorial development and change in key social areas - education, health, transport, tourism, and trade. The result of all this is the legitimization of the development model of modern society. Official authorities, academia, business, and citizens play a key role in drawing up an adequate model for development and transformation. In practice, innovation and new technologies are at the heart of green development. They are the product of an effective business-science nexus and the regional innovation systems that have been formed. Therefore, most of the transition will take place in individual regions, which necessitates the formation and implementation of an effective regional policy. Our understanding is that the new scientific postulates of regional development should be subordinated to the philosophy of the "green deal". At the same time, countries such as Bulgaria are not yet ready with their regional plans for a change toward a green economy. Certainly, several other countries have similar problems, and others even worse. Here is the place to point out that scientists and real businesses should jointly seek solutions to push humanity towards the green transition in the fairest possible way. The green transition will affect all sectors of the economy, not only the EU but the whole world. In practice, this will mean more regionalization of the economy, which will require a complete transformation not only in the way electricity is produced and transported but also in all types of businesses that have to restructure the way they operate.

In recent years, the Bulgarian state has increased penalty payments for carbon emissions. Strategic sectors of the national economy are orienting towards coal mining and the use of coal for power generation. At the same time, the different territories in Bulgaria are characterized by large socio-economic and demographic disparities. These tendencies are reinforced by the fact that Bulgaria is a periphery country in the EU. Regional policy has failed to achieve its main objectives - economic convergence and social cohesion of the country with Western Europe. These conditions increase the economic and financial cost of Bulgaria's green transformation. And this fact makes a just transition in Bulgaria even more difficult. In general, the changes can be framed in several directions - energy, transport, sustainable cities, smart regional development, green jobs, and a circular economy. The circular economy covers all sectors of the economy. Therefore, to successfully meet the EU's resource efficiency targets by 2030, the transition to a circular economy model should become a state priority. This implies that the concept should be expanded not only to waste reduction and recycling but also to the disruption of the dependence between economic growth and waste production (Ivanova, V., 2021).

Regional development as a process in Bulgaria will be subject to the European and national policy for the formation of a carbon-neutral, digital, and smart economy. Therefore, a key concept for the regional development of Bulgarian regions should be the development of e-government elements and the introduction of digital government mechanisms that use big data for management decision-making in the system of state and municipal administration. In the field of the regional economy, achieving digitalization of sectors and clusters of the economy, as well as various spheres of public life at the level of the region, municipality, and locality, the use of big data as a factor in the development of the economy, social sphere, state, and municipal gov-

ernment. In the intelligent management of regional development, the use of new terminology is required to fill with content the spatial development of innovative development processes of individual territorial communities. First and foremost is the notion of “big data” (Yaqoob, Hashem, Gani, 2016), which characterizes the digital data set, the large size, whose rate of increase or complexity requires significant computing power for processing and special software tools for analysis and presentation in the form of human-perceived results. Another concept related to the development of regional technologies is the Internet of Things (IoT) (Shafique, Khawaja, Sabir, Qazi, and Mustaqim, 2020). It is a computer network that connects physical objects equipped with embedded information technologies to interact with each other or with the external environment without human intervention. Another variety is cyber-physical systems (CPS) (Lee EA, 2015), which are intelligent network systems with embedded sensors, processors, and devices that are designed to interact with the physical environment and support the operation of computer information systems in real-time. Cloud computing (Dersingh, Charanyananda, Chaiyaprom, Domsrifah, and Liwsakphaiboon, 2019), is an information technology model for providing ubiquitous and convenient access via the Internet information and telecommunications network to a common set of configurable computing resources (the “cloud”), data storage devices, applications, and services that can be instantly provisioned and offloaded with minimal or almost no operational cost to the provider can also be important in supporting regional development. Thus, in regional development, there is a need for an open data network (Casas, Murgante, Scorza, 2016). Through it, conditions are created for the use of information created by state bodies, their territorial bodies, local government bodies or organizations subordinate to state bodies, local government bodies, or received from these bodies and organizations, which must be published on the Internet in a format providing its automatic processing for reuse without prior modification by a person (machine-readable format) and can be freely used by any person for any purpose consistent with the laws. This creates the conditions for the promotion of e-government at the regional level, which can be an important element toward a fair transition to a green economy.

Based on the above, the authors set as their main objective to analyze the challenges and the regional specificities of the green transformation of the economy and just transition in Bulgaria. Within the framework of the objective thus defined, several research tasks can be defined:

- » to analyze and assess the problems and processes that are developing because of the implementation of the green transition in Bulgaria
- » to reveal the key directions of the Green Deal in Bulgaria
- » to outline the framework of the new regionalization of the Bulgarian economy in the context of the socio-economic transformation of the regions.

The derivation of a methodological apparatus of such an attempt to assess and analyze the processes and phenomena in the regional development of Bulgaria through the prism of the just transition requires a fully interdisciplinary approach. In this sense, the choice of proper approaches and scientific methods and the way of constructing a publication content form the scientific value of work (Kasakliev, Somova, Gocheva, 2019). That is why the authors use the network approach given the interdisciplinary nature of the research field. The network approach builds on classical approaches and methods, representing a modern tool for the analysis and assessment of dynamics in socio-economic systems. This approach imposes the need to justify the need to present scientific results based on expert assessment in modeling the most important factors

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**The methodological approach in the research**

and processes that have an impact on the transformation process. This also determines the leading scientific approach to be built on spatial (horological) and geographical analysis. The authors use trend analysis, comparative, descriptive, systematic, analytical, graphical, geographical, cartographic, historical, and statistical methods of scientific research. Geographical analysis is the basis for clarifying the territorial and spatial projection of the objects, processes, and phenomena under study. The mathematical-statistical method is applied to represent the socio-economic situation and energy problems. The cartographic method is basic for the representation of regional development, the focus of which is enhanced by the graphical and tabular presentation of the main facts used in the scientific work. The descriptive method in the analysis of the sources used, as well as the review of international and national regulations, is fundamental to the development. This scientific development, through a complex methodology, including approaches and scientific and private methods of analysis and structuring of theoretical knowledge, building on them with practical evidence of the applicability of IoT (Internet of Things) platforms as a means of digitalization of processes related to the national development of the country (Goryachko, Choporov, Preobrazhenskiy, Kravets, 2020), (Montanarella, Panagos, 2021). This is realized through the developed IoT platform, under the name ANGIE, which is characterized by its uniqueness at this time in the technology market in Bulgaria. ANGIE platform is a GPS tracker with multiple business applications. Using this platform scientists and businesses monitor business assets remotely in real-time. ANGIE Locator is a good monitoring solution:

- » Vehicles - service fleet, trucks, bicycles, motorcycles, refrigerated trucks, etc.
- » Mobile assets - valuable shipments and pallets, construction and cleaning equipment, machines, etc.

**Figure 1**

Illustration of ANGIE functionality



- » Animal species - farm or stray animals.
- » Management of work teams and SOS signaling in case of accidents
- » Customized solutions.

Through the platform, several best practices are provided where these technologies are applied and have a direct effect on revenue optimization, increasing business efficiency and self-control as a result of the complex system action.

Going through an equitable transition brings to the fore the search for solutions across the entire scope of the national economy. This means adapting scientific solutions more quickly to practice and imposing models that mitigate the negative effects on Bulgarian society of the transition to a green economy. In this regard, different models can be applied in different directions - digitalization of business processes, introduction, and improvement of e-governance, smart development of regions and the economy, development of R&D with applied character for the introduction of new green technologies and innovations, the introduction of circular economy and strengthening of the science-business link. Therefore, the process of green transformation of the economy must go hand in hand with the digitization of all state and business systems for the smart development of regions. In this sense, key features of future development are related to automation (autonomy), electrification, connectivity, and smart (rational) resource management. Given its geography, Bulgaria has a large area of arable land, and agriculture is an important part of the economy. Therefore, proper management of soil resources, including conservation, is of particular importance for the Bulgarian state (Hakrama, Frasher, 2018). In practice, this is the essence of the upcoming green and digital transformation of European countries. The first angle is in the field of business process automation using artificial intelligence, which is embedded in several new technological solutions (Gholami, Mohammadi, 2018). Data transmission networks are increasing speed to such an extent as to provide speeds that enable instantaneous data transfer and processing. Platforms for processing and visualizing the generated data are an essential part of the digitization of business processes. A good example in this respect is the proposed framework for designing pharmaceutical management information systems (Du, Cheng, Yao, 2021).

A good example that illustrates the potential for smart development in the context of the green economic transformation of regions in Bulgaria is the innovation assessment in 2020. [Tab. 1](#) shows that there is a certain contrast in development. A careful analysis of the planning regions in Bulgaria shows that the South-West planning region introduces the most innovations. In this region is the capital city Sofia, in second place in the Northeast region with the leader city Varna,

NUTS	Region	RII	Risk	Group	Change
BG31	North-West	26.0	236	Emerging -	- 4.7
BG32	North-Central	34.9	230	Emerging +	2.1
BG33	Northeastern	35.5	229	Emerging +	8.4
BG34	Southeastern	27.2	234	Emerging -	- 0.7
BG41	Southwestern	55.6	199	Emerging +	11.4
BG42	South-Central	35.7	228	Emerging +	6.2

Source: *Regional Innovation Scoreboard 2021 (2021)*.

## Development of smart systems in different regions

**Table 1**

Regional innovation performance

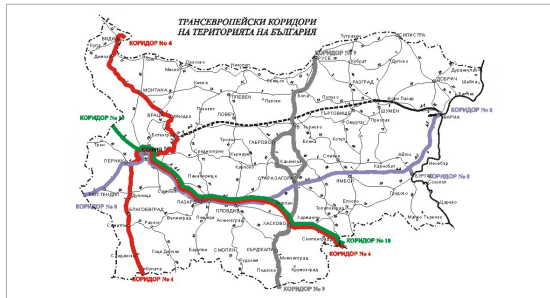
and in third place in the South-Central region with the leader city Plovdiv, which is the second-largest city in the country. The overall overview shows that it can be argued that the leading innovation regions are also the leaders in terms of productivity level. In addition, the methodology shows that to overcome the regional disparity, it is necessary to increase innovation spending and R&D funds in the other three planning regions. In addition, it is necessary to illustrate purely regional profiles of the territories independently in the case of the presentation of the Bulgarian planning regions. In recent years, it has become increasingly difficult to collect reliable primary, empirical material needed to inform the research and to prove the relevance and importance of a topic whose popularity is gaining momentum in the public domain.

Companies will feel the solutions from the Green Deal in two directions. The first aspect is the introduction of many regulations in terms of production, waste, and what changes they must initiate in order not to harm the environment, and the second element is the ways of financing businesses, which will also be in line with environmental requirements. A good example in this respect is the emerging Chinese cities (Witkowski, 2017). Thus, R&D has to look for solutions related to the management and organization of society in the new conditions. In this direction, it is necessary to present the policies designed to serve most regions within the national economy, which should strive to precisely achieve these objectives, namely: better quality of life, preservation of local lifestyle and culture, and economic competitiveness to attract investment. These three objectives should be at the heart of the smart initiative to achieve a just transition. The means to achieve these goals are telecommunications and software platforms that allow mobility, access to administrative services, e-education, and e-health, vital to retain local populations and stem the flow of migration to the big cities. Optical infrastructure has a significant positive impact on business development. The ability to quickly access and exchange information and ideas facilitate the adoption of innovations, increases the innovation capacity of business organizations, and stimulates their innovation activities.

It stimulates the introduction of new and effective business models and strategies and the improvement of the overall organization and management of activities. For example, the framework

**Figure 2**

National and international support of the GCN operator (Source: <http://www.gcn.bg>)



outlined in Figure 2 for building a national backbone network is an expensive undertaking. For this reason, companies that already have or will soon have a completed fiber-optic infrastructure are becoming a determining factor in the development of the country's telecommunications sector. But on the other hand, as a result of the provided access to the Internet, the management of transport chains and logistics of various materials and products is being improved (Tsonkov, Petrov, Berberova-Valcheva, 2022), and the processes of making deliveries are being optimized, and several innovations are being introduced, such as electronic invoicing, contracting, working from home, online payment, e-commerce, new consumer services, online coordination of joint activities, and obtaining services from the public administration.

Another important aspect when comparing different technologies is energy consumption, as over time it is a major contributor to operating costs and direct environmental impact. A comparative assessment of the energy consumed per port for different types of interfaces and network elements is shown in Table 2. The difference between the consumption of interfaces of the same

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Interface type	Network element	Port density	Consumption of port energy (W)
1000BASE-BX	CO switch	High	4.4
1000BASE-BX	Switch in the cabinet	Medium	4.8
1000BASE-BX	Switch in a building	Low	6.7
1000BASE-BX	CO switch	High	4.3
1000BASE-BX	Switch in the cabinet	Medium	4.8
G-PON-OLT	CO switch	Low	22.3

**Table 2**

Comparative assessment of energy consumption

Source: [https://www.mtitc.government.bg/upload/docs/Bulgarian\\_Plan\\_for\\_NGA\\_2013\\_Final.pdf](https://www.mtitc.government.bg/upload/docs/Bulgarian_Plan_for_NGA_2013_Final.pdf) (2013).

type can be explained by the fact that a node with a high port density is more energy-efficient than one with a low density. For comparison, Gb/s Ethernet and point-to-point architecture are used in the study. It is shown that the energy consumption is up to 84% less when using the GPON solution. With AON, the power consumption even increases significantly in the case of placing equipment outdoors, in which case the speed reduction has almost no impact on the overall power consumption.

This means that new innovative technologies need to be developed. Of course, our task is to outline the processes, not to go into them in detail. Due to rapid technological developments, other technologies may also be able to provide next-generation access services in the future. For example, end-user connectivity may be provided through a combination of wired and wireless technologies. The development of telecommunications in a region is determined by the general social and technical level of the region. The reverse is also true: the level of telecommunications strongly influences its socio-economic development. Internet access as an important part of communication connectivity directly influences the economic upswing, and the need to cover the so-called “white areas”, territories deprived of telecommunication infrastructure is increasing. The technological possibilities of some new products and services are being revealed that develop public communications. According to the authors, modern possibilities of digital transformation in socio-economic systems increase the possibility of intensive interaction of objects of these systems regardless of their geolocation (Stetsuyk, Maevsky, Maevskaya, 2018). This approach is strongly connected to green policy applications’ use (Batty, M. et al., 2012).

After 2015, the countries of the European Union are increasingly moving towards imposing models of development of smart cities and regions, which cover increasingly larger territories and areas of gravity (Lusikka, Kinnunen, Kostiainen, 2020). In this regard, there is some experience with the development of national and municipal strategies for the development of smart cities and regions. These include smart city programs and initiatives in the European Union, China, Canada, Russia, the United States, and others. Also, nearly 100 smart city programs are being implemented in India. With several hundred smart cities around the world by 2020. In smart systems, we should have connectivity with each other within a unified concept for the region. The major subsystems include Intelligent Transportation System (ITS) (Arabsheibani, Kanani Sadat, Abedini, 2016), Geographic Information System (GIS) (Hasan, Hussain, Nizamuddin, and Mahmood, 2018), security system (Lv, Kong, Zhang, Jiang, Lv and Lu, 2020), e-education and e-health (Maung, Phyto, and Tun, 2015).

## The need for energy regional change in development

Focusing on the Bulgarian economy, it turns out that it is highly dependent on energy production, including electricity. In addition, it can be said that the Bulgarian economy is resource-intensive. This creates several challenges for the Bulgarian economy because despite everything it is quite energy-dependent on Russia, but on the other hand, Bulgaria is a member of the European Union. This predetermines the need for a qualitative change in the energy system and possibly greater diversification of energy production sources. Although an important decision has recently been taken at the EU level to declare nuclear energy and natural gas as clean energy that does not have a CO<sub>2</sub> footprint, this is not a great option in the new situation. The fact is that coal, together with petroleum products, is now considered to be a strong CO<sub>2</sub> pollutant, which directly affects the coal-producing regions and the baseline capacity to produce electricity from coal. At this stage, the Bulgarian state has basic capacities mainly nuclear, coal, and renewable energy sources (RES). The problems in our country are mainly related to the finding that the upper segment of the existing generating capacities has an almost exhausted technical capacity and needs to be renewed. In the last ten years, the Bulgarian state has not effectively fulfilled its commitment to reach 20% of the production of electricity from renewable sources. As we know, the main problem before maintaining a constant supply of electricity is balancing the system because RES cannot produce energy for 24 hours. They are highly dependent on climatic conditions and the strength of sunshine. The problems in this direction are organizational because a reliable national map of the opportunities for alternative sources of electricity generation has not yet been built. This fact implies restructuring of the Bulgarian energy sector and taking several important steps. This restructuring is related to the relocation of base and sub-structures, regulating the quality of electricity. This process does not preclude the regionalization of electricity production and supply. I.e., deployment of RES and other power plants by region, which shortens the production and supply chains and their connection with regional economies in territorial terms. This process necessitates the construction of a possible new reactor. At the same time, the possibility of locating small mobile nuclear reactors in the vicinity of large-scale production complexes can be considered, given the proven efficiency achieved. Another local energy resource available to the country is energy from renewable sources (hydro, wind, solar, geothermal, and biomass energy). The share of energy from renewable sources in primary energy production in 2018 is 21.52% (according to NSI data). Already in 2012, Bulgaria achieved the mandatory national target of 16% share of renewable energy in the gross final energy consumption in the country for 2020 (Energy Strategy of the Republic of Bulgaria until 2020). In the following years, the achieved share of renewable energy in gross final energy consumption continued to exceed the national target

**Table 3**

Implementation of the national target and sectoral targets (2011-2018)

	2011	2012	2013	2014	2015	2016	2017	2018
Renewable energy (RE) – electricity	12,6%	15,8%	18,7%	18,7%	19,1%	19,1%	19%	22,1%
Renewable energy - heat and cooling energy	24,8%	27,2%	29,2%	28,5%	28,9%	30%	29,9%	33,3%
Renewable energy – transport	0,8%	0,6%	5,8%	5,7%	6,4%	7,2%	7,2%	8,1%
Gross final consumption of energy from RE	14,2%	15,8%	18,9%	18%	18,3%	18,8%	18,7%	20,5%

Source: According to SHARES tool 2018, Eurostat.



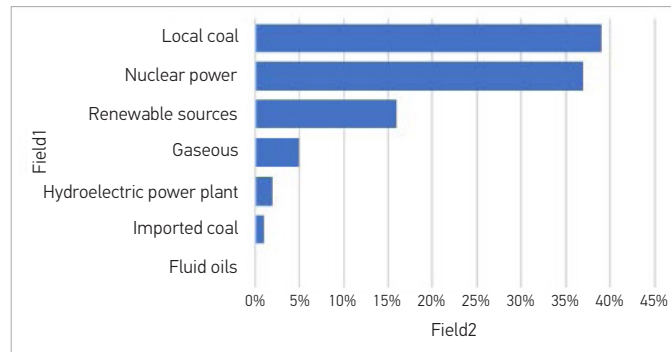
set for 2020, with the main contribution to this being increasing the use of renewable energy in the heat and cooling sector.

Switching to green energy also means abandoning coal-fired power plants. In addition to nuclear power, the use of gas and hydrogen as fuel must be stepped up. Naturally, the construction of renewable energy sources should continue - mainly wind and photovoltaic power plants. Wind farms are highly dependent on the climatic features of the territory. That is why they can be located only in some regions of Bulgaria. Photovoltaic plants

have a greater application. That is why the capacities can be distributed by regions, as in North-eastern Bulgaria are based on wind and gas power plants, central Bulgaria photovoltaics and wind power plants, and Southwestern Bulgaria gas, and photovoltaic power plants. Examples of such are the construction of facilities in Southeastern Bulgaria, where a wind farm and gas power plant will be built, as well as a hydrogen storage facility. It has been proven that hydrogen can be transported in smaller quantities (up to 15%) as a ratio through gas pipelines mixed with natural gas. It is also interesting that in the operation of coal-fired power plants, if the product is mixed with hydrogen, the efficiency will increase significantly, and the harmful emissions will be reduced twice as much. This may be a temporary transitional situation before the plants are closed.

In this direction, the Bulgarian mining industry can still work effectively. In this situation, however, most of the extracted material can be used for export, which will increase the life of the extractive industries and thus preserve jobs.

In other parts of the Bulgarian state, there are different solutions. For example, in the region of Southwestern Bulgaria, it is planned to build a gas power plant and photovoltaics, and a hydrogen storage facility will be built. In this case, it is important to mention that in the case of natural gas fuel plants, if this natural gas is enriched with about 15% hydrogen, then all these measures will achieve a new territorial location of energy and start production entirely on green energy. But, the problem of the possible construction of nuclear facilities, which are necessary for the formation of base power, must be solved. This will lead to the creation of new jobs and stimulate the economy of Northern Bulgaria. Provided that Bulgaria cannot build a new nuclear power plant, we can seek joint participation with Greece, Serbia, and Romania to build new energy facilities that are important for geo-economic development, both in the Bulgarian economy and within the framework of energy cooperation in Southeast Europe. This approach will be able to encourage the development of alternative sources of energy in the border regions. In addition, it is important to look for appropriate economic and social approaches to the development of regional energy. This process may involve the creation of green jobs, the closure of production, and the creation of new high-tech ones, as well as the introduction of a circular economy characterized by regional and national scope with the use



Source: *Energy Strategy of the Republic of Bulgaria until 2020 (2013)*.

**Figure 3**

Structure of the produced electricity by types of energy carriers (2019)

of cross-border energy networks or the creation of regions with clean energy. Of course, the transition to a green economy is accompanied by electrification of transport, the introduction of new industries and technologies (eg robotics, semiconductors), and the orientation of Bulgarian regions to the economy 5.0 (Innovation strategy for the smart specialization of the Republic of Bulgaria 2014-2020, 2015). This also implies the creation of a network of electric charging stations and other types of infrastructure for the electrification of the regions, robotization of production, and opening of new industries with high added value. Thus, a high degree of autonomy of production in terms of the technological process will be achieved, and the installation of photovoltaic systems on the roof structures of buildings will achieve energy efficiency and electricity autonomy (Sustainable energy strategy development of the Republic of Bulgaria until 2030 with horizon until 2050, 2021). This also applies to residential and public buildings. Many green technologies are already being offered in the construction of roads and buildings. All this will change the organization and planning of cities for some to become autonomous.

The restructuring of the economy in the context of a fair transition, as it turned out, implies the closure of some and the opening of other proceedings. From this point of view, the social transition is on the agenda. It concerns the retraining of human resources and measures to improve the demographic situation of individual regions in Bulgaria. That is why the condition and territorial location of secondary and higher schools in Bulgaria is important to link them to the improvement of the socio-economic condition of the Bulgarian regions. Finally, research and development units and "pure" science, the creation and implementation of innovations are key to the development of high-tech industries and their balanced distribution across the territory based on close interaction between science and business. Speaking of the economic development of individual regions, they must use the data effectively. From this point of view, the Black Sea region must open to the sea to fully build a blue economy, and the northern border areas must make the most of the potential of the Danube River. It is important to use the potential of the regions in combination with active state policy and investment activity. This implies the application of some models for spatial economic planning of the territory, considering the costs of labor, water, and energy and relate to business efficiency, potential market, and future sales revenues. From this point of view, in the spatial planning of the Bulgarian economy, considering the territorial peculiarities, we should use the potential of our national territory. In addition, as a member of the European Union, the importance of cross-border cooperation and networking of cross-border geoeconomic development should not be overlooked.

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## Conclusions

With the present presentation and the focus on some possible aspects of the spatial development of the modern nation-state, we have outlined only a small part of the guidelines of the need to implement a just transition. In practice, finding the possibility of implementing effective just transition mechanisms is key to making the transition to a neutral economy in an equitable way, so that no one is left behind.

The authors outline the main issues related to the green transition in Bulgaria as social, economic, energy, financial and territorial. It is very important that when implementing the green transition, the Bulgarian state attempts to mitigate its effects, also trying to overcome the negative processes of depopulation of the regions and social and economic imbalances in the national territory. At the same time, according to the authors, it is very important to combine the construction of renewable energy sources, a digital economy, and the implementation of information technologies to stimulate smart development and smart governance.

The transition to a green economy requires a socio-economic transformation in Bulgarian regions. The transition requires the development of regional development policies that include the following areas - energy, smart development, transport, the opening of new industries and green jobs, and a new regional policy. In this regard, the authors are aware of the conceptual shift in the formulation of future regional policy, proposing new concepts to underpin it. It also means that each country should identify the important priorities for creating a socio-economic environment that has an effective relationship with nature. The burden of the green transition will fall on the Bulgarian regions. This means that, as part of the green transition, transport must be electrified and regional connectivity improved by building a digital economy. As has become clear, due to the serious socio-economic lag and regional disparities, it is crucial to forming a model for the development of the country for a just transition. This equitable transition involves the relocation of economic activities in the national space. That is, a new spatial structure of the national economy will be formed based on the green transition. Due to the resource-oriented economy of Bulgaria, the state should diversify the sources of energy by also building solar, wind, and geothermal power plants. This raises the question of the future of nuclear energy, which, according to the authors, is an alternative for providing energy for the Bulgarian state. Last but not least, the Balkan countries should continue to work towards building cross-border transport, energy and education connectivity, and shared capacity. Only such an approach will yield sustainable results and enhance Balkan cooperation and security among the countries in the region.

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