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The transition to a "Green Economy" – a challenge and a solution for the economy

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Abstract *In the context of the multiple economic crises, the degradation of the quality of life in correlation with the environment are intensely debated topics in the current international policy. Thus, the concept of "Green Economy" was developed as an answer and as a solution to these pressing problems. The development of this concept has taken into account an economic revolution by integrating the environmental factors that will have to be taken into account in any political decision, in a joint international effort. By implementing this concept, the previous term "sustainable economy" will be developed through economic policies that make the economy more efficient, taking full account of climate change, the health and well-being of the population in the medium and long term.*
This study follows an overview of the concept of "Green Economy" and how it could be integrated into the Romanian context.

Keywords: green economy, economic growth, biodiversity, ecosystem, climate change.

Introduction

The green economy is the smartest and most sustainable strategy for improving society and the environment. The ecological economy, the economy for the common good and the circular economy, although of different meanings, have complementary objectives. Can economic results be improved by reducing the consumption of natural resources? Limiting environmental impact, reducing CO2 emissions and combating climate change are possible. Let's look at the basic concepts of the new economy and some reflections.

The green economy, also called the ecological economy or bioeconomy, promotes and fights for a new model of economic growth by improving social and environmental conditions, in order to meet the challenges caused by the latest economic crises (Adger, 2003).

In its most basic form, a green economy would be a low-carbon, resource-efficient and socially inclusive business model. The United Nations Environment Programme, UNEP believes that this economy can improve human well-being and social equity, while significantly reducing environmental risks and environmental scarcity (UNEP, 2018).

The development of the concept of green economy involves the implementation of new technologies and methods of production, adaptation and research, all these elements being closely related to the conservation of the environment and the proper use of natural resources.

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The goal of economic growth without depleting the consumption of natural resources is an important step in continuing the efforts to promote some eco-efficient economies, with an increased emphasis on the efficient use of natural resources.

The characteristics of the Green Economy

The benefits of the bioeconomy are many:

- Promotes people's well-being;
- Promotes social equity;
- Reduces poverty;
- Minimizes environmental impact;
- Reduces carbon emissions;
- Avoids environmental contamination;
- Uses renewable resources;
- Creates green jobs;
- Prevents biodiversity loss;
- Manages waste;

With the development of this green economy system, certain "laws" have been introduced according to Commoner (Commoner, 1971), which are in fact its basic principles, on the basis of which operating principles have been developed.

A first law started from the finding that all the constituent elements of an ecosystem are interdependent with each other, thus suggesting the network interdependence of all elements: living organisms and their environment in which they carry out their physical-chemical activity. The natural existence of a balance between these elements is continuously self-regulated by certain functions that fulfill this balance.

A second law is that: any element introduced into an ecosystem can move in a certain direction of action in accordance with the properties that give it certain functions. This law is correlated with the law of conservation of matter and applied to the economy of the environment, highlighting the fact that in nature there is no waste, these wastes being food for other organisms.

Any factor that intervenes from the outside can modify or unbalance the ecosystem, so a third law issued states that: any external stress caused by a disturbing element in a natural system is harmful to that system. Thus, in an ecological cycle, every living organism cannot, through its own biological functions, contribute to the degradation of the ecosystem. The ecosystems are always subject to external tensions. The man has detached himself through "civilization" from this ecosystemic network. This fact was caused by the accumulation of large amounts of waste in nature, thus appearing the phenomenon of excessive pollution of soil, water and air, the ecosystem no longer being able to self-regulate.

The last law states that: any profit is obtained through adequate expenses. Thus in nature nothing is gained or lost. Thus, through the overexploitation of natural resources for development and profit, deficiencies (imbalances) appear and if they are not covered by human effort, large environmental crises appear. This is the state in which mankind finds itself nowadays, that's why recovery measures have been imposed, so the "green economy" has emerged.

The implementation of a successful economy targets those industries in which innovation has a key role, resources can be reused and special attention is paid to smart solutions coming from the area of processes specific to life sciences (chemistry, biology, nanotechnology etc.).

The chemical industry is an important field that aims to adopt the new concept by replacing the classic production methods, consuming large natural resources with more efficient ones whose investment will be amortized over time by increased efficiency and by meeting environmental goals (UNEP, 2018).

In order for Romania to get closer to the international policies created for a "Green Economy", together with their implementation it will be able to also use models already implemented in other countries and know-how from partner countries and collaborating companies that already successfully apply these rules.

Literature review

The European Union, through regulatory factors, aims at a renewal of the activity of sustainable development worldwide by: defining and applying the various aspects of the green, ecological economy; financial and technology transfer and know-how assistance (especially for developing countries); substantiating the various aspects of governance in the field of sustainable development; involvement of the whole society (Bosetti and Victor, 2011). Thus, various companies were created that regulate and inform on the implementation of the "Green Economy". International examples in this regard are:

FAO and Global Environment Facility (GEF) addresses climate change issues, supports co-financing projects and small grants for developing countries. Green Climate Fund (GCF) promotes growth through climate change mitigation in developing countries.

Green Economy Coalition (GEC) of more than 50 non-governmental organizations, NGOs, companies, research institutes, agencies and trade unions of the United Nations, to influence political debates in decision-making towards the green transition.

Partnership for Action on Green Economy (PAGE) redirects economic policies around sustainability. They guide macroeconomic reforms. They facilitate change through capacity building. Exchange of experiences between countries, conferences, social economy weeks and learning forums.

International Labor Organization (ILO) Green Jobs Program, with an office in Spain, promotes sustainability in companies to improve the labor market and make it greener.

Thus, the transition to a green economy that will have in view a reduction of the ecological deficit can be interpreted from several perspectives, respectively: the reduction of air emissions through the efficient use of resources and the implementation of innovative technologies; adopting environmental management in line with new requirements to include waste management and efficient use of resources (Acar and Yeldan, 2019). Environmental management that promotes the green economy (adaptation after Handbook of Green Economics is presented in Figure 1.

The concept of the green economy is increasingly being discussed especially with a number of initiatives. In this regard, these pressing issues have been debated internationally and diplomatic agreements have been concluded with the action of "reducing the rise in global temperature".

What is certain is that the transition to a green economy is a medium- and long-term process that, in addition to political commitment, also involves the pursuit of the goal through a series of direct initiatives.

The need to "green" the economy changes the classic goal of intensive economic growth to moderate economic growth that takes into account the impact on the environment and implicitly on the population through the processes of production and consumption. It is thus proposed a rational exploitation and management of natural resources (Richardson, 2013).

In order to apply the principle of "Strong Sustainability", the rule of natural capital Kn was imposed, through a series of ecological criteria (Safe Minimum Sustainability Standard), among which the rate of regeneration of resources or the capacity to assimilate the environment (OECD & WTO, 2013).

An important criterion for this type of approach is to limit economic growth and to impose a "deep green economy" with the ethical extension imposed on the environmental component. More specifically, when people engage in actions aimed at nature, the impact of the consequences on the environment should at least be taken into account (Chakravarty, 2009). An example of an ecological criterion as a requirement for the adoption of the green economy is a requirement that must be met by a product or a producer to demonstrate that that product or production process has a low impact on the environment compared to a product or a process that performs the same functions (the eco-label) (One value, 2021).

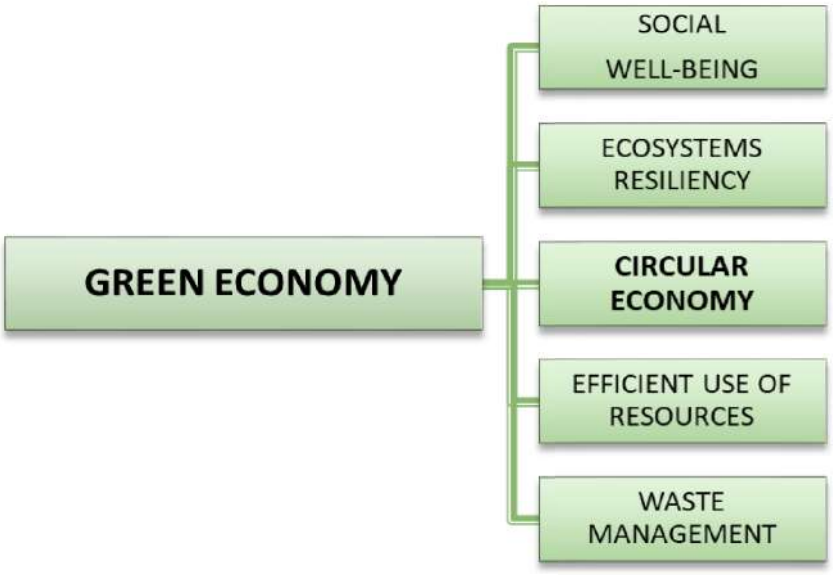

Figure 1. Environmental management that promotes the green economy
Source: Handbook of Green Economics, 1st Edition, 2019.

Maximizing biological, ecological and social objectives and providing environmental, social and economic services for all members of a community, without endangering the viability of the natural, anthropogenic and social systems on which the provision of such services depends, have imposed the adoption of the sustainability triangle (EEA, 2019).

As a structure, it has three integrated pillars: environmental, social and economic, but the priority in this sense is not the economic growth, but the economic, social and protection of natural resources development, in conditions of simultaneity and cross-correlation of the three dimensions. The interrelation of the three factors are presented in figure 2.

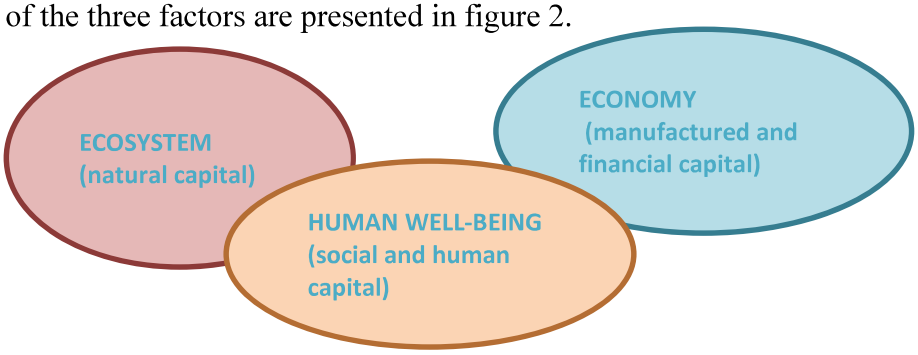

Figure 2. Three integrated pillars of Green economy: environmental, social and economic
Source: The EEA's 9th report.

An effective representation of the concept of green economic development, which clearly highlights the three dimensions and emphasizes the importance of environmental issues (Parrique, 2019), can be approached in terms of the availability of capital stock in an economic system, depending on its use in production:

1. economic capital, defined as the generic production capacity of an economy, which consists only of that part of man-made capital (physical and human) and natural resources (renewable and non-renewable), exploited to be transformed into economic processes;

2. ecological capital, defined as the total stock of renewable resources (used and unused in the production process), natural and semi-natural lands, ecological factors such as nutrient cycle and climatic conditions, which are the part of natural capital that determines the overall quality of the ecosystem;

3. natural capital, defined as the basic natural resource of a geographical area, consists of ecological capital and stocks of non-renewable resources;

4. total capital, represents the totality of physical capital, non-renewable resources, ecological capital and human capital.

Principles of the Green Economy

Table 1. Principles of the „Green Economy"

TYPE	PRINCIPLES
Economic	-Recognizes natural capital and values; -Integrated economic development and growth models; -Internalizes externalities; -Promotes resource and energy efficiency; -Creates decent work and green jobs;
Environmental	-Protects biodiversity and ecosystems; -Invests in and sustains natural capital; -Recognizes and respects planetary boundaries and ecological limits; -Advances international environmental sustainability goals;
Social	-Delivers poverty reduction, well-being, livelihoods, social protection and access to essential services; -Is socially inclusive, democratic, participatory, accountable, transparent and stable; -Is equitable, fair and just-between and within countries and between generations;

"Green economy" is a functional model that would allow the conservation of natural resources and stop greenhouse gas emissions and, at the same time, the poverty reduction, says the report of the United Nations Environment Programme (IISD & UNEP, 2014).

This "Green Economy" program would respond to various "crises" such as climate change, biodiversity erosion, food supply and growing problems regarding the access to fresh water (EU, 2021).

A number of technological changes are proposed in several sectors, so as to take into account the average factor (Johnstone, 2010):

- Generating green energy by: setting up wind or photovoltaic parks;
- Energy efficiency by: ensuring good thermal insulation of homes and buildings; limiting fuel consumption: gas, water, electricity, etc.).
- Development of industrial branches that promote environmental values.
- Sustainable forestry;
- Intensive use of means of transport with alternative fuels;
- Efficient waste management.

Methodology

Economic analysis of environmental issues can be approached from two perspectives of microeconomics and macroeconomics. From a microeconomic point of view, it allows the verification of the adoption of cleaner or more efficient technologies as feasible or if the adoption of energy policies in one country has an impact on other countries. In terms of macroeconomics, research can be done on the relationship between the environment and economic development, i.e. an appropriate study on the issue of sustainability. This line of research makes it possible to assess, for example, the existence or absence of an environmental Kuznets curve for a pollutant and whether the presence of pollutants interferes with the conditional convergence of countries on per capita income and speed (Sukriti, 2020).

In fact, this concept promotes the transition from the classic economic development model in which environmental protection is perceived as an economic burden, to a model that uses environmental protection as the main pillar of economic development (Strunz, 2018).

Unfortunately, it is much more complicated to translate this idea into reality. What is clear is that a refurbishment will be needed. But it will also require many other changes based on the way the business is organized. But effective change will be needed in all sectors, from policy makers to business people to individual citizens. This will be necessary with the dissemination of the decisions taken.

The European Environment Agency EEA, through its activity, has the role of interpreting and communicating the decisions taken at political level. This agency has an important role in disseminating and developing knowledge in the Green Economy.

Another key for design and implementation of new policies, instruments and actions to address the key environmental problems and promote economic opportunities. At the international level this is done via the international conventions, treaties and agreements. At national and local levels it is most often done via environmental fiscal reform (changes in taxes, fees, subsidies etc.) or in projects and various initiatives like green jobs programs, green bonds, and other green investments, innovations and demonstration projects that can be scaled-up (EEA, 2021).

Key elements to be considered during the transition period to "Green Economy":

- Value of natural capital
- Appropriate economic regulations and incentives
- Appropriate environmental regulations and law enforcement
- Sustainable production and consumption patterns
- Fair distribution of income and social standards
- Investment in training and environmental education

The main goal of the transition is to foster changes from the current economic development paradigm, to an economy which generates economic profits while ensuring environmental sustainability and social inclusion.

Dynamics driving economic growth and environmental impacts

Figure 3 provides a simplified representation of the dynamics that link different elements within Europe's socio-economic and environmental systems (in gray boxes), based on an analysis of the ways that these elements have interacted causally in the past. The gray arrows in the figure represent the direction of the causal links and their character (positive or negative). Europe's GDP has increased steadily in recent decades, with relatively few interruptions (ETC/WMGE, 2021).

As shown in Figure 3, this trend has two main outcomes: first, income increases, leading to higher GDP via increased consumption and production (reinforcing loop R1); second, investment increases, leading to more innovation and cost competitiveness, in turn increasing production and

GDP (reinforcing loop R2). These two reinforcing loops (R1 and R2) also trigger economic growth through employment creation and trade. Economic growth also gives rise to many balancing loops, which slow the increase in GDP. The EGD itself highlights a variety of costs to the society, which have been integrated into Figure 3. For example, economic growth typically leads to increased demand for mobility, which results, among other things, in congestion. This reduces time spent at work and at home, creating societal costs and lessening GDP (balancing loop B1). It also reduces production and value added (balancing loop B3). Increased energy use leads to air pollution, which affects labor productivity via health (balancing loop B2). The increase in energy use also implies increased energy spending, which heightens vulnerability to market dynamics and extreme weather events, affecting competitiveness and innovation (B4) and negatively impacting production. Production, in turn, leads to the generation of waste and water pollution, which affects food quality, creating societal costs in both urban and rural areas (B5).Simplified representation of dynamics linking elements in Europe's socio-economic and environmental systems is presented in figure 3.

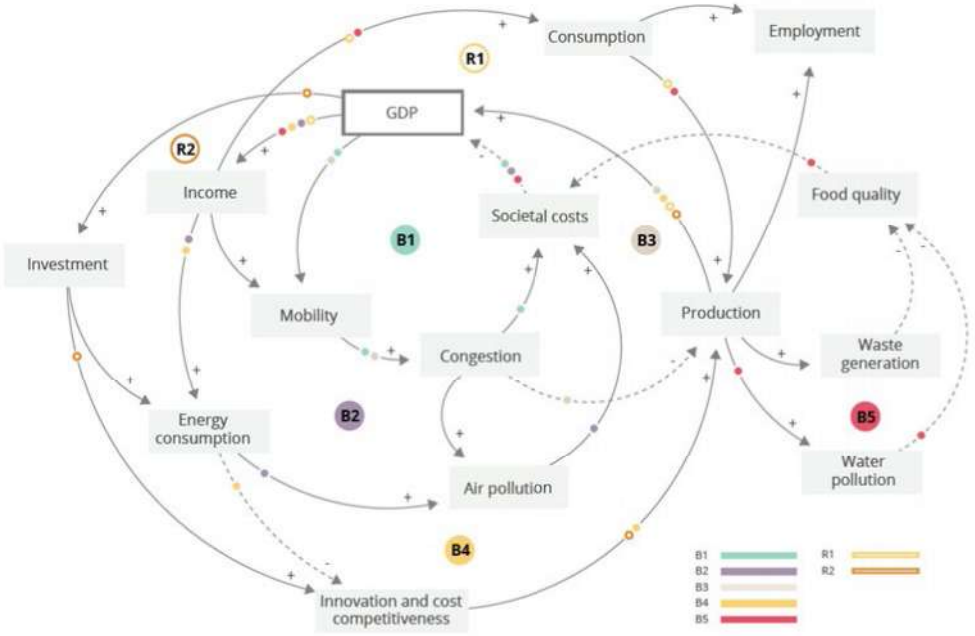

Figure 3. Simplified representation of dynamics linking elements in Europe's socio-economic and environmental systems

Source: ETC/WMGE (2021).

Gray boxes represent socio-economic and environmental systems. The solid gray arrows represent positive (+) causal links and the dashed gray arrows represent negative (-) causal links.B, balancing loop; R, reinforcing loop.

The balancing loops presented in Figure 4 represent just a few examples of the growing costs for the society associated with economic growth. Such costs are not emerging to the same extent in all countries and regions. For example, urban areas are affected more by air pollution than rural areas.

The system dynamics depicted in Figure 4 provide a basis for understanding how the EGD seeks to enable the shift to a sustainable European economy. As outlined previously, the EGD uses a variety of policies and legislative measures to influence energy, buildings, transport, waste and food production. The outcomes expected from these EGD interventions are described in the red text. The latter includes cleaner air, water and soils as a result of interventions related to energy

efficiency, clean energy, waste reduction, recycling and reuse (the promotion of a circular economy), and improved agriculture practices. Simplified representation of dynamics influenced and triggered by the EGD is presented in Figure 4.

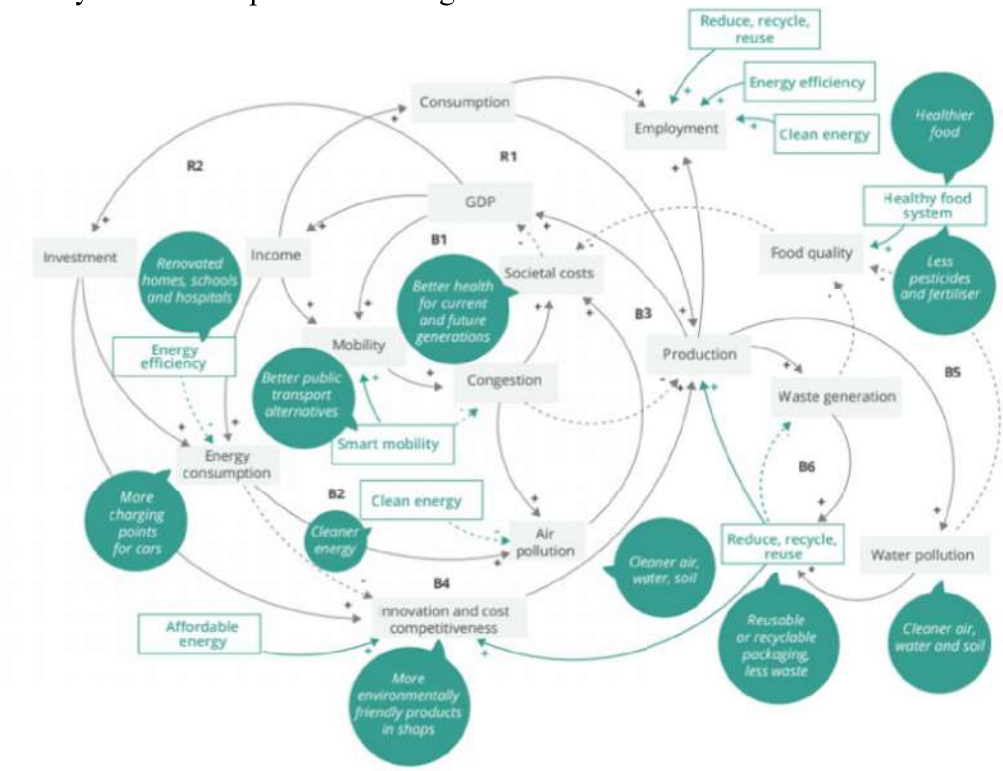

Figure 4. Simplified representation of dynamics influenced and triggered by the EGD
Source: ETC/WMGE (2021).

Green boxes represent the key intervention areas (e.g. energy, mobility, food), gray boxes represent socio-economic and environmental systems and the text in the circles indicates the intended benefits of the EGD. The solid gray arrows represent positive (+) causal links and the dashed gray arrows represent negative (-) causal links. B, balancing loop; R, reinforcing loop. Source: ETC/WMGE (2021).

Collectively, these insights indicate that the EGD's basic approach is to promote green growth by building on the efficiency gains of recent years: strengthening the reinforcing loops driving GDP growth, while weakening the balancing loops linked to factors such as pollution, congestion and waste.

Results and discussions

The green economy in Romania has great development prospects. Thus, Romania, through the Green Deal plan, will adopt the following measures related to:

- Updates of policies and legislation to implement this system through a legal and regulatory framework that will favor integration in the Romanian business environment.
- An objective assessment of the current state, setting targets, evaluating implementation, step by step adaptation in this new process.
- Carrying out strategic projects that must be approached from the point of view of attracting European and resilience funds for innovation and technology in the context of the Green Economy.

- Development of infrastructure at national level by integrating renewable energy sources.
- Adoption of new energy storage systems and improvement of energy efficiency that will increase the share of stored green energy.
- Development of specific mechanisms to ensure benefits for participants and to capitalize on the integration potential of renewable energy sources.

The need to implement a green economy is undeniable, but not all countries have equal access to the huge potential benefits it can bring. Many emerging and developing economies face challenges that put them at a lower stage in implementing these new economic systems.

An important impediment is access to investment. Globally, there is no shortage of funding. But because of the perceived risks, many parts of the world are struggling to attract key investments in their energy systems, especially in the private sector.

Capital is significantly more expensive in emerging and developing economies compared to advanced economies.

The United Nations Environment Program (UNEP) predicts that with the transition to a green economy, there will be a gradual reduction in jobs in areas closely linked to polluting sectors such as oil and coal. On the other hand, activities such as the production of renewable energy have to cope with an increase in labor demand, either for the development of new technologies or for the technical operation of generation and distribution systems. UNEP indicates that agriculture will be among the sectors with the highest potential for job and income generation once the economy is "greened".

Conclusion

The Green economy development campaigns aim at economic development by improving the quality of life of the society, with equal opportunities, without compromising the environment.

Climate change, renewable energy, resource constraints such as water, the social development of present and future generations, biodiversity, endangered animals or organic farming are some of the issues that need to be considered when it comes to economic sustainability.

The circular economy is closely linked to the aspects of increasing competitiveness.
For this purpose, inter-ministerial working groups dedicated to the implementation of the concept of the circular economy, respectively of the circular bioeconomy have been created.

The implementation of the "Green Economy" will require a combination of smart policies, financial innovation and sustained collective action by the international community. A knowledge system capable of supporting the needed socio-economic transformation would also have many other dimensions.

The countries that need additional investment must also take their own steps. They need to strengthen their sustainable financing system, to address the barriers to foreign investment, to eliminate the regulatory risk, to streamline licensing and land acquisition procedures, and to repeal the policies that distort local energy markets.

It must inform the general public and the economic environment about the benefits of adopting green technologies, and encourage, through measures such as reductions in taxes, discounts on the purchase of green technologies.

Transforming the European economy in ways that enable it to get prosperity within environmental aspects will ultimately rely on the emergence and diffusion of new ways of working, living and thinking.

In the environmental context in which we find ourselves, it is extremely important for Romania to support this approach and to advocate together with the other states, for a transition to a fair, sustainable society, built around the common good and with care for nature.

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