

## 7. Economic policy measures on the environment and energy sources for sustainability conflict in Romania

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*The paper describes sustainability conflicts created by some of the economic policies on environmental protection and to achieve a sustainable energy policy.*

*The present paper draws on the hypothesis that green energy projects create conflicts of sustainability by increasing the price of electricity, thus damaging the economy by decreasing the competitiveness of production factors and also creates social conflicts and other serious problems for exposed social strata.*

*This paper describes the first global aspects regarding the use of natural resources and energy, a short presentation of the European policies, country (Romania) and local level situations with special attention to the energy sector and environmental requirements. It describes the general framework of policies for the use of natural resources in Romania. The social and economic conflicts presented are related to broader conflicts concerning green energy, in particular wind energy. Although the objective of green energy projects is a very good one, as they have less negative impacts on the environment. However, these projects have also some disadvantages and may present inconveniences that might be disadvantageous in the long run. The economic aspects analysed here are: the structure of ownership of these investments and their way of subsidising the costs and benefits. From a social perspective the paper focuses on the positive side of these investments, their costs and social risks as well as on the measures taken by and the involvement of the Government and the effects brought by these measures. In the section related to environmental problems there will be discussed some of the negative effects of green-green and green investments. The paper relies on data given in formal agreements, contracts with European Union, statistical data from the National Institute for Statistics, National Agency in Energy and Government data.*

*Keywords: sustainability, economic policy, sustainability conflicts, natural resources, Environmental Kuznets Curve*

### **1. Introduction**

Creating a sustainable and safe environment for energy production is part of our daily preoccupations. This necessity for sustainability has become of vital importance due to recent succession of events which point out the weaknesses of current systems and energy supply. Some of the recent examples are the nuclear accident in

Fukushima in 2011 or actions taken by Russia which use energy supply to gain political and economic leverage.

The present paper aims to describe some of the social and economic conflicts that are brought about by economic policies that mean to create a strategy for sustainable energy policy. The topic of the paper is discussed from a rural point of view, specifically rural development thus economic policies are analyzed considering rural economy and the effects of economic energy policies on rural areas.

To verify our hypothesis the study analyses in detail two policies that have generated divergence in Romania, these being the green energy policy and the exploitation of natural resources (mineral, oils and shale gases). The analysis below is structured as follows: first the paper discusses the global situation followed by examples of sustainability conflicts on a global scale, then it moves on the situation in Romania describing in detail the sustainability conflicts in our country. As the topic of my doctoral dissertation concerns the sustainability of rural development, the problem will be presented from a national and local (rural areas) level.

## **2. Describing the global and European framework**

On a global scale we can observe the same level of globalization in terms of energy as in any other economic sector. Global competitors can have influence through: natural resources or technology. As far as natural resources are concerned, some countries have a significant advantage over others – e.g. countries with large resources in oil and gases like Russia, Kazakhstan, Iran, etc. or mineral resources like China. The global market of these commodities shows a high dependency on these countries, the European Union being one of the largest importers of energy generating fuels, and largely depends on this market. Current technology used in everyday life and industry relies heavily on these resources. Developing new technology is a very slow process especially if investors are not motivated enough. The competitive advantage is, on the one hand, obtaining these resources, and on the other hand the technology used to exploit these resources. From this perspective, the global players are the USA in exploiting shale gases, China in making wind turbines and solar panels and Western European countries, like Germany who also have the capacity to make and export leading technology.

The International Agency for Energy predicts a massive increase of energy demand (with 50% more in 2030 compared to 2003). If the shift in technology doesn't occur this tendency will also present itself also in the case of oil demand which will rise by 46%. According to our present knowledge, if we continue to ex-

exploit oil reserves at the current rate, it will only last till 2040 and natural gases till 2070. Moreover, predictions indicate an economic growth which involves increased energy consumption. The International Agency for Energy (IEA) points out that global consumption between 2010 and 2020 should change faster towards using renewable energy sources and natural gases. Coal should remain an important source of energy covering one quarter of the world's primary energy needs (this resource should hold for another 200 years if exploited at the current rate). Recent geopolitical problems, the increasing demand, the growing inelasticity of refining capacity and increasing the states' resource reserves for crisis scenarios, have all lead to an increase of the prices. In these circumstances, the primary issue is stability and short term energy supply security meaning environmental sustainability.

Nuclear energy seemed to be a solid choice until the accident in Fukushima (Japan) in 2011. These events lead to massive reorientation of energy dependent countries towards renewable energy sources (especially Europe). The commitment of the EU towards having a competitive and clean energy is also motivated by climate change and the vision of a sustainable Europe can be found in the Europe 2020 strategy. The European Union policy on energy for the 2014-2020 period has three main objectives: Sustainability by reducing greenhouse gas emissions to reduce the global warming effect to only 2°C more than in the pre-industrial era. Competitiveness means to effectively implement the internal energy market and creating energy supply safety. As far as energy imports are concerned, the aim is to reduce EU's energetic dependency and to avoid supply disruption and possible energy crisis or insufficient supply in the future. The above mentioned objectives are described in the "20-20-20" targets, namely:

- reducing greenhouse gas emissions at EU level by at least 20% compared to 1990;
- increasing the use of renewable energy resources with up to 20% of the total energy consumption in the EU and up to 10% renewable bio-fuels of the total energy consumption in transport. For this reason a common framework has been created in order to promote renewable energy resources in order for the EU to achieve a 20% share for renewable energy from the total energy consumption by 2020;
- reducing basic energy consumption with 20%, by improving energy efficiency compared to the level achieved without these measures.

Another important EU objective proposes to reduce the level of greenhouse emissions with 30% by 2020 given that other developed countries will adopt similar objectives (EC 2010).

Moreover this change of policy favoring green energy deployment can be seen in the research conducted by the European Wind Energy Association, which indicates that between 2000-2013 the dominating source of green energy installed was wind energy followed closely by natural gas.

### 3. Theoretical framework on sustainability conflicts

It is an obvious reality that achieving sustainability has its limitations, economic sustainability and sustainable economic policies are both hard to achieve. Some important arguments are described by Antal (2004): on the one hand, it is doubtful that debts even below 60% are sustainable, on the other hand, maturing debts can cause tensions if these are to be paid from important social funds. Once the national currency depreciates, government debt increases, even if severe restrictions and budget cuts are applied it may not reduce the debt to a desired level. If these measures affect purchasing power (the wage cut of public servants by 25% or the increase of energy prices), these reduce consumption affecting economic growth. Attracting foreign capital and investments will not transform directly into debt, but revenues from these are easily repatriated and obligations contracted by the government need to be fulfilled which may be hard to achieve (a typical case is the implementation of green certificates).

Simon Kuznets (1955) in his work „Economic Growth and Income Inequality” analyzed the relationship between economic growth and economic inequality and illustrated it with help of a curve. His hypothesis is that once an economy develops, the GDP after peaking will lead to a higher level of national income and as a direct effect economic inequality decreases. Based on the analogy of this idea the environmental Kuznets curve was formulated (Grossman–Krueger 1995).

Agras and Chapman (1999) categorize the influencing factors of the environmental Kuznets curve. In case of developing economies, if the GDP grows the environment deteriorates, while in case of developed economies GDP growth has a positive effect on environment.

This means that some of the factors listed below have a positive effect on GDP but they have a negative impact on environment. These factors are the following: export-led growth and industrialization, as well as declining energy prices. The opposite effect occurs with increasing imports. Energy efficiency development in conjunction with environmental protection policies have a positive effect on the economy, the GDP and the environment.

The GDP growth will have a positive effect on environment once energy efficiency is implemented and the principle is applied. Both developed and developing countries have environmental policies.

Sustainability conflicts may arise from specific investments which endanger local biodiversity or the natural habitat of some species. This case is also described by Hoexter (2012), where he discusses about the natural habitat of condors affected by windmills.

On the other hand, conflicts may arise from applying energy policies to certain levels of economic policy and it may also affect national, local and intermediate policies (Byrne et al. 2007). Another energy conflict in the United Kingdom, described by Upreti (2004) focuses on the social dimensions of development of biomass power plants, based on the four case studies from England and Wales. The paper examines impacts of public oppositions on planning permission because local communities value environmental benefits of biomass energy; they are more concerned about the immediate negative local effects of power plants on their respective regions. Main sources of conflict over biomass energy development were related to location of the plant, perceived risks, and negative effects to ecology and landscape compared to few economic benefits to local people. The author also mentions problems related to the implementation of these policies, namely, the stakeholders' feeling of injustice, weak public relation strategy of the developers and low level of awareness.

A similar sustainability conflict which is relevant from our perspective is the conflict generated by the water used for producing green energy – “blue impacts of green energy” (de Fraiture et al. 2008). The authors point out the possibility that biomass production for energy will compete with food crops for scarce land and water resources, already a major constraint on agricultural production in many parts of the world.

Furthermore, another frequently described conflict with various manifestations is the high price of green energy. For now, we can say that with the exception of hydroelectric dams the production costs of electric energy in power plants which use renewable energy sources are currently superior to those that use fossil and nuclear fuel. The use of these resources and the attraction of investors in renewable energy production are motivated by state aids conform to the EU practices and measures which eventually lead to an increased energy price for the end user. Thus, they have a negative impact on competitiveness. The energy being used by the industry has an inflationary effect and diverts demand structure and this results in less money for other goods in households. In their article Carbaugh–St. Brown (2012) mention the trade conflict between different countries, especially conflicts between USA, China and Europe. The paper discusses the relationship between industrial policy and trade

disputes in renewable energy which arise when governments use industrial policy to promote the development of new industries and the creation and adoption of new technologies. The green energy policy involves subsidies granted to producers and consumers, usually for the purpose of correcting a market failure. Concerning renewable energies such as wind energy and solar energy China, United States, and the European Union provide extensive support to producers and consumers and this support has resulted in trade frictions among these nations.

#### **4. Energy policy in Romania**

The legislative approximation in Romania has been achieved gradually. The first important step was the Government Decision no. 644/2005 which foresaw an energy market opening of 83.5% and in November 2005 the green certificate market was introduced. The legal framework for the total opening of the energy and natural gas markets was made possible by the GD no. 638/2007. From the perspective of legislative approximation of the European 2020 strategy, meaning a 20% increase of renewable energy sources from the total energy consumption and a 10% increase in renewable biofuel in transportation. In order to achieve this target, national mandatory objectives are set for each member state. For Romania, the national target is 24%, to be achieved by 2020. This objective was already accomplished last year in a record time – implementing the green energy system which produces 24% of the necessary energy was subsidized by green certificates paid directly by the end users. Due to this generous policy, which favours green energy investors, this sector was the most attractive in Romania, resulting in over 3 billion euros invested in this sector.

The most important investments were not made by the local actors, but by international investors like the Czechs (CEZ group) who invested 1.1 billion euros last year in a wind farm consisting of 240 wind turbines, this being the largest investment of its kind in Europe. The Italians (ENEL) invested over 400 million euros in order to take advantage of one of the most generous subsidies. Energias de Portugal or other companies with massive investments in the Romanian energy market.

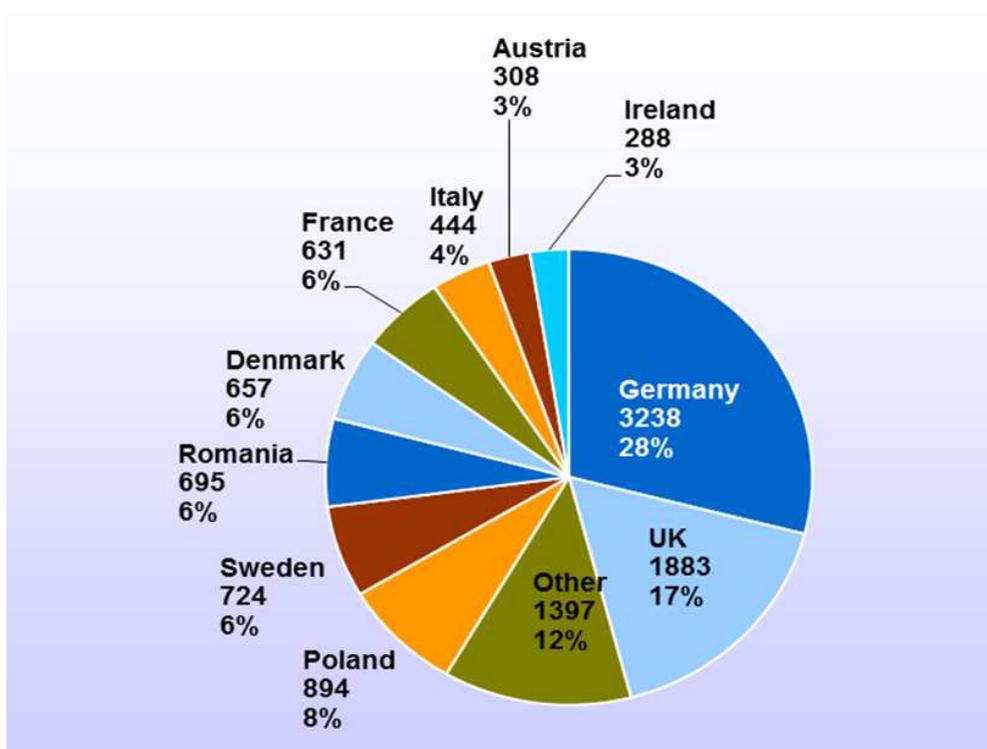
It can be observed that the exploitation of natural resources is in most cases left to foreign companies due to the lack of competitiveness of local companies. This outsourcing process of natural resources exploitation triggered two major public impacts. The exploitation of gold resources was outsourced to a Canadian firm which proposed an exploitation technology using potassium cyanide.

The subject of another controversy was Snake Island (Black Sea). From the moment of winning the trial with Ukraine regarding the area rich in conventional re-

sources (like oil) to be exploited, these areas had already been outsourced to foreign companies in exchange for very little benefits.

Romania has doubled its capacity to produce wind energy compared to 2012. This way Romania is among the first 10 countries who invested in wind energy. The biggest investments were made by Germany and the UK, Romanian occupying the 5<sup>th</sup> position in the European Union (6% of the total investment being made in Romania).

*Figure 1. EU member state market shares for new capacity installed during 2013 in mw. total 11 159 mw*



*Source: The European Wind Energy Association (2014, p. 5.)*

Due to this massive investment increase in wind energy and other green energies with the help of green certificates, a massive increase in prices has been experienced, especially at household level. The price of electricity was 0.105 euros/ KWh in 2012 and it increased to 0.135 euros/ KWh in 2013 this being one of the largest increase ever recorded. Unfortunately, this increase of the electricity price didn't

happen in a favourable economic environment, meaning that the incomes didn't follow the same upward trajectory. Similar increase could be observed in other countries as well, such as Germany, but the buying power and incomes in this country are significantly larger. One positive aspect of this is that the price of electricity remained basically the same for industrial consumers. If green certificates had been applied entirely, this increase would have been even higher, but in mid-2013 a part of the green certificate payments were delayed and rescheduled after 2017. This process is part of the total liberalization process of electric energy markets and includes not only the increase of electric energy prices but also that of natural gases from 49,8 RON/MWh (1 July 2013) to 119 RON/MWh (1 October 2018). These prices have been increasing every three months with dynamic quotas for industrial manufacturers as well as households. The highest increase of energy price among the EU member states occurred in Romania between 2011-2013 (from 0,108 euro to 0,132 euro/KWh). Although this price is below the European average the increase had a negative effect on Romanian population because it took place simultaneously with the decline of wages and purchasing power.

Households and industrial consumers are the two most affected market segments. As Table 1 (Romanian Prognosis Commission) shows, these two market segments represent 65,4% of end users and they are predicted to experience further increase in the near future and that this process will stabilize along with the achievement of energy cogeneration objectives.

*Table 1.* The structure of end user energy consumption in Romania 2009-2020 (%)

<b>Indicators</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2020</b>
End user energy consumption, out of which	100	100	100	100	100	100	100	100
Household energy consumption	35,9	35,7	35,5	35,6	35,4	35	34,5	31,9
Economy-wide level consumption	64,1	64,3	64,5	64,4	64,6	65	65,5	68,1
Industry	27,8	29,1	29,9	29,9	30	30,4	30,8	32,5
Constructions	1,8	1,8	1,8	1,8	1,9	1,9	2	2,4
Agriculture, forestry, fishing	1,7	1,7	1,7	1,7	1,7	1,7	1,7	2
Transport and communication	24	22,5	22,1	22	22	22	22	22,1
Other economic sectors	8,8	9,2	9	9	9	9	9	9,1

*Source:* Comisia Națională de Prognoză (2012, p. 10.)

This is important because as it is mentioned in the Romanian partnership agreement (p. 12.) Romania ranks among the EU Member States with the highest share in GDP of industry (29%) and agriculture (6,6%) and one of the lowest share of Business Activities and financial services (15,3%). Thus the price of electricity for industrial consumers is very important.

Some important aspects regarding energy consumption in Romania: according to the data provided by the Ministry of Industries basic energy consumption increased between 1999-2008 by 8,2% which is lower than the gross national product in the same period (23,9%). It has been noticed that Romania also faces the separation of economic growth and the rise of electricity prices. This is a phenomenon present in all developed countries starting from the period after the first oil crisis, and this process can be also found in the data provided by the Romanian Prognosis Commission on energetic intensity (Table 2).

*Table 2. Energetic intensity indicators (tep/1000 euro 2008)*

<b>Indicators</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2020</b>
GDP (billion euro 2008, constant prices)	130,6	128,4	131,6	133,7	137,8	142,7	148,3	175,7
Total energy intensity (total energy supply per GDP)	0,3	0,3	0,3	0,4	0,3	0,3	0,3	0,3
Primary energy intensity (primary energy supply per GDP)	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Domestic energy intensity (domestic energy consumption per GDP)	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,2
End user energy intensity (end user energy consumption per GDP)	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2

*Source:* Comisia Națională de Prognoză (2012, p. 11.)

Green energies are subsidized directly, the amount being calculated according to the quantity of energy used. We, as consumers, pay for the manufacturers for the green certificates appearing on the invoices of the products we buy, we also pay for high efficiency cogeneration (by which consumers actually subsidize technological development) and from this year we pay for regulated compensatory, i.e. for possible losses suffered by producers from trading in the free market. These payments appear as consumer taxes as they are calculated on the basis consumption. For the moment there is no risk of price competitiveness in the industry but on a long-term

basis, increasing prices may seriously affect the economy and there might appear the risk of de-industrialization of the country. The Romanian Partnership Agreement contains an analysis of the country's competitiveness, and the table below supports what has been said before by showing those indicators that are connected to the energetic sector.

In the Romanian energetic sector there are two major problems that need to be solved in the near future: on the one hand, the large number of depreciated assets, the modernization of energy transportation and storage; on the other hand, energy infrastructure, especially green energy, should be developed and broadened in order that our country be able to export the generated energy surplus.

For what regards green energy, the following problems and possible conflicts can be observed: a systematic problem connected to our accession to the European Union and the harmonization of the legal and economic frameworks is that the contracts and agreements between our country and the EU as well as the legislation harmonization does not properly account for the country's economic development and the possible changes in trajectory of the local and global economy. There is no framework that would allow for changes in case of agreements and contracts. Changes should be allowed and applying such changes should be related to social and economic factors. In this case, for example, green certificates could be introduced on account of income increase or the two could be adjusted somehow. There are no "if" clauses linked to real economic and social changes.

*Table 3. Romania Competitiveness Scoreboard – Distance from EU Average (standard deviations)*

	-3	-2	-1	0	+1	+2	+3
<b>Innovative Industrial Policy</b>							
Labour productivity per hour worked (2010)		X					
<b>Sustainable industry</b>							
Energy intensity in industry and The energy sector (2010)		X					
Environmental Protection expenditure in Europe (2009)						X	
Exports of environmental goods (2011)			X				
<b>Service Sectors</b>							
Electricity prices for medium size enterprises (2011)							

*Source:* Ministry of European Funds (2013, pp. 11-12.)

At the macroeconomic level: the present green energy subsidizing system introduces, in fact, double taxation: on the consumed electricity (on green energy and efficient energy cogeneration) and we also pay VAT on these, in other words we pay double consumer taxes – we pay for the producer and we pay for the government a

VAT for subsidizing green energy producers. Moreover, we can even say that we pay triple tax because manufacturers include the electricity prices in the price of the given product we buy. As electricity prices increase the government's income will also go up due to the double taxation described above. This seems to be a downward spiral which will destroy the economy. It will generate inflation, will reduce the real income of consumers, it will reduce the consumption all which will result in bankruptcies, the rise of unemployment rate and an income decrease.

Up till now, the increase of electricity prices were adjusted to the inflation rate and now inflation is brought about by rising energy prices.

Another problem generated by these investments is that they mean neither an economic backward nor an economic forward because it requires workforce only at the installation phase (and the equipment is imported from Western Europe and China) and afterwards it functions with minimum personnel: a guard, a mechanic and an administrator. After energy plants are constructed the energy doesn't need to be "transported" and it doesn't link to any other sector or transfer its excess costs. Thus, it doesn't generate economic growth.

At the microeconomic level: our life could be described using an astrological metaphor: we are the microeconomic planet, our sun is our income which we work for, our moons which affect us daily are the exchange rates of currency, electricity bills and fuel prices. The effects of these three "moons" are felt in every aspect of our daily lives and any change is paid by us, as we are the end users. Our worst fear is total eclipse, meaning the simultaneous rise of electricity price, exchange rate and fuel price and all these will use up all of our income and leave nothing from our salary after we paid our bills and we bought the necessary items. Unfortunately, those with average or below national average level of income have a consumer basket containing only the elements influenced by our "moons" (food, electricity, fuel).

At the rural area level, the most affected social strata is composed of those with low income and living in poor social conditions, rural areas being characterized by low income population. The increase of electricity prices due to green energy leads to a heightened risk of poverty and to social exclusion.

Some proposed solution would the following:

- One of the first and easiest solutions would be not to apply VAT to green certificates or high efficiency cogeneration. Thus, the price paid by us would slightly decrease and we wouldn't be subjects to double taxation. This depends on the government and could be easily applied as we pay the radio and TV tax with no VAT applied to it. Not applying VAT to green energy would stop double taxation and would be one of the fastest solutions available at the present moment.

- Setting the limits of green certificate prices (inferior and superior limits) would be beneficial for both consumers and investors. Consumers wouldn't pay more than the maximum limit and investors would surely benefit from a minimum subsidy, so it would be easier to predict the functioning of these firms. However, these limits should be respected; otherwise investors would face an unforeseeable situation.
- The increase of electricity prices should be rescheduled according to the growth of the population's real income. For this reason, Romania should collaborate with Bulgaria (where the government was forced to resign due to the forced increase of energy prices) and other countries facing the same problems, in order to renegotiate the conditions imposed by the EU. The rise of electricity prices should be adjusted to income levels, especially since we achieved the proposed target.
- An idealistic objective is to benefit from these resources. For example: shares from the state companies producing green energy. We could have a special investment fund where we get shares according to how much we paid for green energy or a fix monthly amount (thus we would have equal chances, protecting the vulnerable strata of society). This fund could be financed by state energy companies' profits or revenues. This country has exploitable resources and we could receive revenues from the exploitation of the resources. If these resources are to be invested the long term effects are positive, but the profitability will not occur from one day to another and the problems needs to be solved faster. Thus, the resources need to be divided and a part of the revenues should become subsidies of this kind. This way we can compensate the rise of prices directly just like the money which is taken directly from us by the electricity bills.
- Local level solution would mean investment in green energy in the public sector (city and county councils) and the profits from these investments should redistributed by reducing local taxes. The problem is that city and county councils also lack funding, with the decrease of household incomes and companies' profits lead to a drop in the local authorities' income. Thus, very few will be able to invest in green energy. These investment for the public sector should be financed entirely (for example street lighting with green energy – it would mean a lower cost for the town hall and they could impose lower local taxes). In order to be achieved, these should be introduced among the 2014-2020 priorities and the state should grant enough resources.
- The Ministry of Industry proposes that exposed social strata should benefit from state aids to partially cover their electricity payments

- Possible solutions offered by the Ministry of Justice for rural areas include counselling, thermal insulation, modern stoves (which are considered too expensive, thus less accessible and the procurement of which would require subsidies), street lighting with green or alternative energy resource to ensure reduced consumption. The use of biomass seems to be an achievable factor also in rural areas especially space and water heating.
- Small hydropower plants appear to be another potential investment in rural areas (accessible for a limited number of market segments). With regards to small hydropower plants, a possible conflicting situation might arise (already present at some investments), namely not taking into account the natural environment, inadequate and/or insufficient measures are taken regarding the water's flora and fauna, or environment protection (for example non-functional fish ladders).
- In areas with geothermal energy capacity, these can also be exploited – using geothermal water as an energy resource – however, they require big investments.

## **5. Conclusions**

The paper discusses issues related to sustainability conflicts and highlights the possible conflicts among different sustainability principles. The present case study analyzes the conflict created by green energy investments in Romania, in other words how green energy subsidies have had a negative impact on society and economy. By implementing some energy policies Romania has done some important steps towards achieving cleaner energy and ensuring the country's energetic safety. The measures, the present paper analysed, were the green energy subsidies through direct payments by the end users. These massive subsidies have attracted big investments in this sector reaching the target of ensuring 24% of the energy need on a country level by the end of 2013.

This process resulted in several sustainability conflicts: steps taken to ensure a clean environment and a greener energy from renewable resources have led to unfortunate economic and social effects. Negative economic effects are the inflationary pressures caused by increased prices, reduced consumption and on the long run the decreased competitiveness of companies and of the industry in general. At the social level increases the risk of impoverishment and social exclusion, the most affected social strata consisting of those with low income rates and rural areas. Certain situations proved that the natural environment and habitat can also suffer from green energy investments.

In the next phase of the research I will attempt to quantify the effects of economic policies related to the energy sector, with special attention to rural areas.

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**Part two:**  
**Enterprises and Micro Policies**