Could Shale Gas Become a Reliable Energy Source for Europe and Romania?

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Abstract: - While shale gas and oil is a success story in USA and Canada where production has considerably increased in the last five years the situation is quite different in Europe where exploration and production activities are quite low and prospects are not encouraging. Even in the Eastern Europe the first results of exploration are disappointing for the American companies, which have the technical expertise for exploring and extraction shale gas. Due to global warming there is now at the world scale a fierce confrontation between environmentalists and lobbyists of producing companies regarding the negative effects of hydraulic fracturing. Shale gas development in Europe depends more on the coal substitution by gas and on the use of CCS technologies. The collapse of crude oil prices may delay many projects in the field of shale gas and oil, especially in Europe. The prospects of oil gas in Romania are linked to the energy security concept, whose implementation requires diversification of energy supply on some levels. The development of shale gas in order to diversify the energy supply cannot compensate the groundwater pollution and other negative effects, like earthquake. The temporary withdrawal of Chevron from Romania will have some positive effects, allowing to our country a necessary time-out to better substantiate public policies in the field and to producing companies some time required for carrying out new technologies, less polluting and harmful.

Key-Words: shale gas, fracturing, reserves, technology, environment, pollution, energy security, substitution, projects, public policies.

JEL Classification: Q 41, Q42, Q48, Q51, Q58.

1. Introduction

In the last years when global warming or greenhouse effect has become the most important and pressing problem of humanity a new fossil resource has rapidly entered in energy sector, shale gas and oil. Shale gas is a resource that has come relatively late in the energy landscape, particularly in the last 10 years, with the improvement and imposing of extraction technology, hydraulic fracturing, in the US. Expectations concerning this new source of energy have been great, but so far, they have been confirmed only in the US and Canada, while in EU exploration results are not conclusive. We have two kinds of impact of this new source: a positive one, on the level of energy supply, and a negative one, on the environment. As producing companies usually keep secret their production costs, it is rather difficult to measure the profitability of shale gas extraction and to reject the opinions on the creation of a new speculative bubble with the financial support of investments banks. Estimates of shale gas reserves for various areas differ significantly and practically we do not know precisely what amount of shale gas we may count on. In addition the rate of depletion of shale fields in operation is much faster than that of traditional methane fields.

Six months after the collapse of oil prices, America's shale business based on horizontal drilling and hydraulic fracturing and causing an impressive boom of oil and gas production is not in a significant decline as it was believed by some analysts, companies and countries (Economist, 2015). In the first quarter of 2015, many independent companies had a good financial situation mirrored by the situation of their balance-sheets (the equity level compared to debt level).

2. Too much optimism for the future of shale gas?

Several studies made in the last years have concluded that even in the most optimistic case in Europe, the net benefits of shale gas are expected to be relatively limited due to several major reasons: 1) Europe disposes of shale gas reserves much lower than expected; 2) their location, in relatively deep geological layers, makes more difficult and costly their exploitation, which is technically and economically less advantageous than in the United States; 3) the population density is higher in Europe, and thus the potential collateral damages are more threatening and public opposition more fierce; 4) in some areas further investment is needed in infrastructure; 5) the legislation is inconsistent, scratchy and unpredictable. EU should accept that if it fails to provide an overall framework favorable to exploration operations (primarily the legislative stability), American companies, which exclusively detain the technical expertise to achieve this objective, will refocus on more attractive targets such as Australia or China. Forecasts made in the period 2013-2014, by several prestigious Western institutions specialized in energy, like the International Energy Agency, Energy Information Administration, assigned to shale gas a share between 6 and 14% (in a optimistic assumption) in ensuring the total gas demand of the EU by 2030, which means a relatively small contribution for increasing the security of energy supply. The transnational company British Petroleum (BP) made a more radical prediction that shale gas will have a more modest contribution of only 6% in satisfying the gas needs of Europe by 2035; as a consequence, the continent will become even more dependent on gas imports, whose share in consumption will increase from 60-65% at present to 84% at the end of the forecasted horizon.

The environmental impact of hydraulic fracturing has been a subject of heated debate between environmentalists and corporate lobbyists, the arguments of both parties being more subjective and less well scientifically based. That is why the impact could be partially assessed only for the US, given its tradition in this field, but there are no clear statistical data even about the number of wells drilled, much less on the complex impact on the environment; under these conditions we are witnessing a fierce confrontation between environmentalists and producing companies, which makes it extremely difficult to find the scientific truth. In any case, the expert opinions indicates that shale gas fracturing is not the ideal solution for densely populated areas from Europe, mainly due to high environmental risks.

Neither direct economic benefits of the shale gas in the EU, nor indirect benefits, i.e. the spillover effects on other economic sectors, will be important. Socio-economic net benefits of shale gas development in the EU Member States will be strongly influenced by the "balance" of compromises with the competing sectors involving other land uses, such as agriculture. This will be particularly important for the Member States with large agricultural sectors and/or with a large number of people employed in agriculture (as a share of total employment).The benefits related to employment of labor force will also be moderate, given that shale gas is a capital intensive segment rather than a labor intensive one, with most jobs created on short term only and especially in the early stages of development.

In an average time perspective the diversification of natural gas import options may diminish the interest in the development of domestic shale gas deposits in the EU. An essential role in this option will be played by the price at which natural gas will be available from multiple sources, including LNG, compared to shale gas and also with other competing energy sources (including renewable). An essential role in determining a pro-shale gas orientation will have the breakeven costs for alternate energy sources.

In essence, we may say that the recovery process of European shale gas is on stand-by, which on the medium term represents a relative advantage for the US and Canada, whose gas exports (LNG) to Europe seem quite unavoidable. Europe, actually the EU, needs a coherent energy policy, which currently it does not have. There is an incoherent amalgam of national programs, ranging from Germany's commitment to phase out nuclear energy to promotion of renewable energies, whose subsidies have become more burdensome for national governments, or more precisely for the whole population on whom costs are transferred.

Shale gas can not become a viable transition fuel to a low carbon economy, unless coal will be substituted on a large scale by shale gas and CCS technologies (CO2 capture and storage), which are quite

underdeveloped in Europe today, will become widespread. The fact that in the US shale gas has helped to reduce GHG emissions is due shale gas substitution of large quantities of coal burnt in the power plants, and due to export of large coal amounts to Europe.

Specific responses of governments, regulators and commercial players to the needs of the emergence of shale gas industry in Europe are to be defined. These responses could significantly affect the progress pace and pattern of European shale gas industry in the coming decades. However, the opinions of several independent experts and specialized institutions converge to the idea that, even with the best practices and best political support, shale gas will not be able to change the "rules of the energy game" in Europe, not in terms of security of supply, nor to significantly cut the greenhouse emissions.

Despite these findings, not very optimistic, there is virtually no reason for EU countries not to try to explore the shale gas potential and to exploit the discovered resources later, obviously if opting for this solution by taking into accounts the limitations and difficulties of fracturing process. Options belong exclusively to national states due to insufficiently knowledge of involved risks, and this is also one of the reasons why the European Commission has not taken the responsibility of developing a common regulatory framework for the domain concerned.

The US experience shows that pollution risks can be avoided, but some environmental disturbance, although inevitable, may only be minimized thanks to technological advances. It should be mentioned that is up to the Member States and local communities to decide whether and to what extent these risks are tolerable. To do this it is necessary that operating companies to show transparency in relation to state authorities in which they are active and ensure the free access to information and a fair application of the best practices, including the assimilation of the latest technologies to ensure a reduction of environmental risks.

Shale gas should not be presented to European population as a fake project for an easy access to a cheap energy source or as an alternative to renewable sources. Presentation of shale gas in a false opposition to renewable sources would undermine the transition of Europe to a low carbon economy Shale gas will not be a panacea, but an additional solution for the growth of energy security, along with renewable and energy efficiency.

Despite the controversial issues related to the impact of hydraulic fracturing technology, the EU countries, heavily dependent on energy imports (natural gas and crude oil) from Russia in particular, will have to work towards diversifying their sources of supply, while making use of potential own resources, which include in some cases the evaluation of shale gas reserves and their exploitation, if their commercial viability is confirmed, while giving special attention to the risks attached to fracturing technology.

Worldwide, but especially in Europe, if the collapse of crude oil prices that started in the second half of 2014 will last for a longer period, there will be an increase of the risk of compromising or, at best, delaying the projects for the exploration/exploitation of shale gas. If the oil price would have remained at over $100 a barrel, shale gas and alternative energy sources would have replaced imports from OPEC area. But at the current price of conventional crude oil, which stands at around $60/barrel, and considering that one of the most lucrative areas (Bakken) of US shale gas exploitations is profitable at a price of over $65/barrel (according to Bloomberg New Energy Finance), the exploitation of shale gas and oil is not so profitable in USA and may not at all in Europe. Obviously it will be cheaper to import oil and gas, than to exploit new shale fields even in the US or Canada, using sophisticated, cutting-edge technology.

Therefore, the US energy sector itself is likely to be strongly affected, even more than European shale gas sector, where operating conditions are much more difficult and costs are significantly higher. If oil prices remain for long time around $50/ barrel, some of the negative consequences now presented as hypothetical are likely to become reality. Already, big companies such as Schlumberger and Baker Hughes announced major restructuring processes and an Ernst & Young report claims that possible bankruptcies of smaller companies followed by mergers and takeovers by bigger companies are likely to follow. The world is marking important moments in the evolution of fracturing technology in the USA and perhaps globally, which is likely to reach a ‘reset’ of the whole structure of primary energy sources balance, which is very necessary for the survival of the planet.

The role of exploration/production companies and their behavior in the new context of an oil market characterized by low prices, costs adjustment, reallocation of resources and new market strategies will be critical in determining the overall framework of the oil market over the next two years. The United States will be at the centre of re-balancing mechanisms: projects’ portfolios will be re-examined, discretionary spending will be cut and in this context, strategic decisions will slow down and even projects considered ‘robust’ could be delayed as the companies are reviewing their strategies. Companies with strong financial assets will find

themselves in a favorable position to acquire other companies' assets, when they feel that oil prices have stabilized. However, oil companies in the US have a relative advantage as they are able to reduce costs without affecting future projects, by freezing indefinitely certain less profitable projects, unlike competing petroleum states, whose economies are heavily dependent on oil revenues, and cannot reduce prices indefinitely without causing themselves major social and economic imbalances.

Currently, considering the low prices of conventional crude oil, the shale oil and gas revolution seems to come to an end, before it even started. Private companies have already decided to withdraw from European countries which were assessing the potential for unconventional resources (Chevron has announced in February 2015 that it's giving up on its operations in Poland after a similar decision was taken in regards with Lithuania and Ukraine). The decision is likely to be fuelled by the unattractive prospects of oil prices. Furthermore, some renowned research institutes in the energy field have decided to give up their in-depth research on the shale gas topic until drilling results show consistent evidence of viable development. Given the opposition to drilling, the low oil prices and the likely slow pace of development, this may take a few years.

The most important issue for the future exploration/exploitation of shale gas and oil is to decipher the unhidden agenda of the OPEC oil prices mess that is, whether this was a unilateral measure intended to undermine the American shale oil competition, or if it is a wider agreement with US interests. The second scenario seems more plausible, because it is bringing greater benefits to the parts involved, as it promotes climate change policies, namely renewable and energy efficiency measures. Both policies were considered 'too aggressive' for US conservatives, and by reducing fossil fuel price, the gap between the oil price as a benchmark and those of renewable energies is widening to a level that will discourage both non-conventional energies and energy efficiency programs.

However, there are opinions (even from OPEC countries) which argue that oil prices will gradually recover in 2015, in the range of $80/barrel, as resources are quite limited, most oil-exporting countries are facing large budget deficits and the demand will increase as the economic crisis will fade away. In other words, the oil price crush will likely prove to be a speculative distortion.

3. The prospects of shale gas in Romania

The security of energy supply represents a critical matter for Romania, although to an extent significantly lower than for other EU Member States, whereas Romania is among the countries with the lowest degree of dependence on energy imports within the European Community. Based on international estimates of EIA on the existence of an important potential of shale gas reserves (about 1460 bil.c.m.). Romanian authorities, through the National Agency for Mineral Resources (ANRM) has already granted exploration licenses for around 30 oil concession agreements. Changes in the context of international oil market has led to some changes also in Romania, but despite this, it will have to continue the exploration of potential resources to determine with any degree of certainty whether or not it has enough shale gas. Romania is in a relatively unpleasing position because with the exception of a report carried by specialists from the Romanian Committee of the World Energy Council in 2013, CENTGAS, who argued that 'our country would have a great potential for shale gas discoveries in the Eastern Carpathians, the Moldavian Platform, Bârlad Depression and the Romanian Plain, with extension to the South Dobrogea', there is no definite quantitative estimate made by any Romanian scientific authority or from the gas industry or geological institutions. Furthermore, the issue of exploring the national territory potential of shale gas reserves has also a geo-strategic interest, especially in the context in which Russia is trying to achieve supremacy in the Black Sea basin and altering the old 'balance of power'.

The decision whether to continue exploration operations did not belong to the Romanian state, but to the main company holding the licenses, that is Chevron and other companies involved. From various reasons, among which the fact that relevant reserves have not been discovered so far, Chevron, decided to withdraw (more precisely to freeze its operations even if they have discovered some shale gas, because of the low price of crude oil which makes their exploitation unprofitable in Romania, arguing that the profitability of the operations is lesser than other operations from its energy portfolio.

The most important question for policy makers at all levels in Romania is whether the potential impact of fracturing (public health and environmental risks) may be offset by economic benefits. The results of exploration phase and a clearer picture of the economic viability of resources of unconventional oil and gas will clarify one of the many unknowns on the development of shale gas in Romania. Delaying the project on shale

gas in Romania may have a positive side even more because at this stage there is no clear answer to the question whether and to what extent the potential impact of fracturing (public health and environmental risks) may be offset by economic benefits.

There are many uncertainties about the economic impact of shale drilling in Romania, the most important being that the risk of grounding decisions and public policies based on too optimistic or too bleak prospects, ignoring the cost of externalities or the benefits of security of supply. Also there is more uncertainty about the environmental impact of hydraulic fracturing. The possible increase in natural gas supply and the reduction of imports cannot compensate for groundwater pollution, soil degradation, small surface earthquakes, affecting agriculture and tourism, massive pollution of the environment, damage to scarce water resource, especially in the Eastern part of the country. The earthquakes in Vrancea may lead to the production of micro-faults in areas where intense exploitation of shale gas is made or where wastewater is placed. Therefore, a cost/benefit analysis should be based on evidence, not based on exaggerations (Starting from data on resources, which according to several Romanian specialists, especially in mining activities, should be taken with reservation, and ending to the pollution of groundwater).Unfortunately, the Romanian government seems to have a positive answer for investors and for the opening of exploitation in any circumstances, before proposing any amendments to the current legislation and without having thorough studies on pollution in any prospective area before starting production operations.

Given the high costs of geophysical exploration and by wells, there have been chosen for the concession of respective perimeters the specialized foreign companies with technological and financial potential. Among the advantages of this option one can mention facilitating the technology transfer, superior project management skills, flexible logistic chains, access to capital in the global financial markets, etc.

Without falling into the trap of the concept of *hard nationalism* for natural resources, Romania should follow the examples of countries that have successfully exploited oil and gas resources and to act on the principle that international companies are meant to provide financial and technological support in exploitation of natural resources, without forgetting that hydrocarbon resources belong to our nation and must be exploited for the benefit of it. However, given the low experience in shale gas, significant investment costs and high geological risks, especially in Europe, Romania, as other states, which started earlier exploration operations of the national potential, will have to consider the flexibility of the legal and fiscal regime for the shale gas in the sense of giving some tax breaks for companies interested in participating in the process of knowledge and technology transfer in the preliminary phase of exploration.

Tax regime in the oil and gas field is already a delicate matter and also a controversial problem having in view that for almost ten years the state has been accused of favoring foreign oil companies involved in the exploitation of subsoil resources by imposing reduced fees and charges; charging of a low tax currently would more feed the idea of political and economic favors granted to these companies Announced as imminent to the end of 2014, a new tax system is expected to come into force in 2015. It has been shown that new royalties are applicable only for the new concession agreements, as for the concession agreements in force concluded for 30 years their level cannot be changed. Oil and gas companies are interested in clarity and predictability in the fiscal and regulating regime, generally they are keen to see the issue of royalties decided and stabilized for at least 20 years.

Our main operator in Romania, OMV, the majority shareholder of OMV-Petrom, reacted quite aggressively at the prospect of any increase in taxation. Although it said it wanted "to turn Romania from a gas importer to a gas exporter to Europe", OMV has warned that if the fees will increase, it will cut the investments, spreading the idea of ceasing exploration activities in the Black Sea: *"The first step that we shall do when we discover hydrocarbons in the Black Sea will be to directed them to the local market. We are talking about replacing gas imports from Russia, for which the price is very high, but it depends on the charging system and price. There are two important components in any business. We can not do investments if we are not profitable.* "

We believe that, for the concession of natural resources it would be necessary/possible the imposing of an "offset" type condition by which companies try to put something in place, possibly in economy, the requirement of a technology transfer to the local mining and energy industries, if not participating in the growth of the adjacent industries (possible reference to the case of Petrom-Arpechim-Oltchim).In terms of improving the regulation framework**,** Romania should to adopt the model of *reactive responses* to the risks associated with technology by changing domestic regulations in order to cope with the likely impact and impose stricter regulations, especially with regard to water resources. In this sense Romania must extend the evidence base in order to take the right decisions. For this it is necessary to involve several state authorities, universities,

research institutes, civil society, environmental organizations, consulting firms to evaluate the possible effects of shale gas. The regulatory framework should find the balance between the economic viability of shale gas protection of the environment and security of supply.

In Europe, where shale gas activities in the field are in an infancy stage, only Poland and the UK have adopted specific regulations for this sector, other European countries applying general rules valid for the oil sector. Romania does not have specific provisions for unconventional gas, aspect related to the applicable technical rules and instructions for the exploration and exploitation of these resources. Richard Davis, an expert at the "Shale Gas Europe" suggested that Romania has to assess the information on the quality of technology, after the model set for regulations in other countries, to refer to the best practices used in the United States, to the mode how was developed this sector in the UK, where the Environment Agency is working with the Department for Energy and Climate Change and industrial companies to ensure that regulations are effective in terms of environmental protection.

In Romania gas price liberalization for small industrial consumers was postponed (originally scheduled and assumed for the end of 2014), the same in the case of households (originally scheduled for 2018 but postponed to 2021). There is no reason to assume that the market price of natural gas in Romania would not converge in time to the European gas prices having regard the Commission's efforts to complete the establishment of a single gas market in Europe (see Regulation no. 312/2014 of 26 March establishing a network code for balancing transport networks in the gas sector). We believe that the wholesale price of natural gas supplied in Romania will come closer to the prices of the nearest geographically hub- CEGH (Baumgarten, Austria). Thus, we are supposing that by the time of starting the production of unconventional gas resources and their trading market in Romania, the alignment of wholesale supply prices will be complete for both the households and the industrial customers in Romania. But the level of future prices will depend on the competition between different sources of natural gas, a great potential there is in the Black Sea, where Romania may produce almost 6.5 billion c.m. in 2020 (Exxon/Petrom, Lukoil and Carlyle are involved) and additional gas may come by means of AGRI project (LNG from Georgia but produced and exported by Azerbaijan).

In the years ahead, gas price liberalization of the domestic price of natural gas will significantly increase the revenues of the producing companies, which would also be a good reason for an additional taxation of the profits of foreign companies operating in Romania that would benefit from an *undeserved gift*. Under these circumstances, the Romanian legislation has to remedy the unnatural situation in which natural resources found in the proximity of a community become rather a cost than a net gain for the respective community. Improving the legal framework should also cover some aspects of social acceptability. In fact, mistrust and even hostility of a large part of the population may be considered the most serious obstacle to the development of shale gas resources in Romania.

Moreover, in Romania, prevails a distorted public perception on the environmental and health risks related to the development operations of shale gas. Under such circumstances, the effort made to articulate the public interest only through a rational cost-benefit analysis may not give the expected results. On the other hand, distrust prevailing in society concerning the efficiency and integrity of state institutions, amid the lack of a culture of transparency and public consultation on the matter of exploiting mineral resources, induces more radical positions and reduces the chances of social consensus.

Government should consider creating financial incentive mechanisms for local communities, as did other European countries that are more advanced in the exploration and exploitation of unconventional resources (UK, Poland). If the Romanian state - the rightful owner of mineral subsoil resources of any real land from Romania – decides to exploit them, the owner of the land located above those mineral resources is entitled to some compensations agreed together with the State. Changing the tax system for operating shale gas deposits will have a vital importance for the social acceptability. In the case that it is diminished the prospect of collecting some revenues from shale gas exploitation and allocation of them to the local communities, social acceptability would be severely affected. In Britain, for example, to promote the development of shale gas, the government decided that local councils which allow the development of shale gas may fully keep all the fees and charges collected by them from exploiting this resource. Such a solution would be both fair and would reduce the risk of social protests and dissents.

According to Law no. 255/2010 on expropriation for utility public interest, necessary to achieve some objectives of national, county and local interest, shale gas exploitation (though not explicitly named in the law) may be considered a national interest objective since these resources belong to the state. Any company that takes over concessions in Romania should be aware of the fact that any transaction may be affected by the ambiguous nature of the rules which enshrined the owners of land property. In Romania, the order of private

property was not fully restored, as such hidden costs of investment - generated by the conflicts between institutions, between state and citizens and further between companies and the owners often wronged - may go beyond the strict legal framework, also having a strictly economic determination. It is an economic one, because the return on any investment depends on sound regulatory and clear property rights and guarantees provided by the parties involved in transaction.

European Commission recommends baseline studies before starting the operations of high-volume hydraulic fracturing, Member States will ensure that the state of the reference *(baseline)* is described in an appropriate way and reported to the competent authority before commencing operations. There are also monitoring requirements that recommend to the Member States to ensure that the operator regularly monitors the production facility and the surrounding area, on the surface and underground. Institutional capacity is very important in the development of shale gas, and especially the available resources for strengthening the administrative capacity. Thus, Member States should ensure that competent authorities have adequate human, technical and financial resources to perform their duties. Member States should prevent conflicts of interest between the regulatory function of competent authorities and the function related to economic development of resources carried on by these.

Since the Romanian government is in the process of developing the national energy strategy, we consider that evaluating energy policy options between coal and gas is an essential aspect for the future decisions on electricity production. Investments may be directed to change the energy mix and technology support – by subsidies or/ state aid (according to European regulations) or public policy measures (for example, by means of certificate trading schemes for CO2 or full liberalization of fuel prices for electricity production). The development of shale gas in Romania is unlikely to have the same effect of substitution between coal and gas as in North America, but higher prices for certificates for carbon dioxide emissions may have a significant impact.

Security of supply may be improved not only by diversifying the country's natural gas sources, but also by diversifying interconnections with neighboring countries. But without the exploitation of new sources of natural gas, in particular those from Black Sea, import dependence could soon become a burden. Ukrainian crisis has radicalized European policymakers that seem more determined as always to act in a more effective and cohesive manner to enhance EU energy security by promoting an Energy Union which tends to offer concrete and valuable solutions and ways to reduce dependence on oil and gas imports from Russia, through diversification of gas supply sources, but also by turning to account a greater part of its own energy resources.

4. Some final conclusions

Romania would need shale gas production amid the depletion of conventional gas reserves due to high dependence on imports from Russia, but there are not known the environmental risks and the technology of hydraulic fracturing should be replaced by "friendly" environmental ones. Exploitation of natural resources in line with the national interest would mean in the case of shale gas also an effective environmental protection, as well as maintaining ecological balance and rising of living standards, not its depreciation. The possible increase in the supply of natural gas and decrease in imports cannot compensate the groundwater pollution and other negative effects like earthquakes. The negative externalities are not usually mentioned by producing companies and are not compared with economic and social benefits. In addition, Romania can not claim a right of first beneficiary in having access to new extracted gas, so producers will be able to export the gas without being forced to firstly provide consumers needs in Romania, and prices will be aligned over several years at the level of those liberalized and close to import price from Russia.

As worldwide numerous methods of clean fracking are in the process to be developed and will be launched on the market in the next few years, and because the low price of crude oil on the international market already freezed a number of projects in the field of unconventional hydrocarbons, the delay imposed by Chevron to shale gas operations in Romania is welcomed, because it will allow our country a necessary time-out to better substantiate public policies and to oblige the concession companies to make use of the latest and nondestructive operating technologies.

Meanwhile, Romania will have to focus on other solutions for enhancing energy security, including the gas deposits exploitation in the Black Sea, continuing nuclear energy projects, completion of pipeline interconnections with neighboring states, implementing measures for energy efficiency. The future, at least in the short term horizon of renewable sources (RES) and their legal support system -Law 220/2008 -must also be

clarified. Since 2013 the number of green certificates awarded for each type of technology for RES was reduced by a Government Ordinance, while the remaining subsidy is to be paid from 1 April 2017 on. Combined with a drastic decrease of prices of green certificates and with the reduced capacity of National Power Transmission System to take increasing amounts of intermittent energy the future of renewable energies seems uncertain. The problem is aggravated by the low level of international oil price, which discourages the investments in relatively expensive equipments for RES production. However, the raising costs of implementing energy efficiency measures are becoming increasingly hard to justify from an economic perspective. Thus, the current context does not really favor the actions for climate protection by means of the RES, energy efficiency and capped carbon emissions.

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