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THE EFFECTS OF FISCAL POLICY INSTABILITY ON WIND ENERGY RESOURCE DEVELOPMENT IN ROMANIA

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ABSTRACT. The instability of the Romanian economic framework and the frequent and sometimes unexpected changes in legislation influence long term development plans in the field of energy production. The recent introduction of property taxes for wind turbines is expected to have a devastating effect on further development plans for large wind farm operators in Romania. Legislative changes related strictly to wind energy are reviewed comprehensively. The paper calculates the net loss to wind energy producers under an optimistic, yet extremely unfavourable scenario. Elements of a potential worst-case scenario are also reviewed for comparison. The real problems come into focus when we begin to look at the logical, inevitable consequences of the latest changes in policy in the field of renewable energy in general and wind energy in particular. It becomes apparent that it is not the way policies change that carries the most significant negative impact but simply that they do change, signaling would be investors that the system in its entirety is unstable.

JEL Classification: Q48

Keywords: renewable energy, wind power, fiscal policy, development.

Introduction

Public policy instability is known to produce undesirable effects as far as private investments are concerned. The aim of this article is to assess the impact of different changes in public policy on the wind energy sector in Romania under various scenarios. Results will be calculated based on changes that are already in effect and taking into account some of the options that are most likely to be adopted by wind energy producers. A descriptive review of the situation in other European countries will form the basis of our predictions with regards to the decisions that are most likely under current economic policy conditions.

The assumption is that changes in energy policy alone are responsible for a net loss in revenue for wind energy producers. This article firstly looks at confirming this loss and further more at calculating the size of the net loss under several scenarios.

A number of articles show the negative impact of changing systemic conditions on the wind energy sector. Spain, the second largest producer of wind energy in Europe, owes its place to its former stability in terms of legislation and regulations regarding renewable energy

and has seen a major downturn in capacity installed annually as a result of recent changes in tariff conditions (Bueno-Lorenzo, 2013). Favourable tax incentives or the lack thereof have been shown to negatively impact the US wind energy sector creating severe short-term fluctuations between massive investment and complete stops (Wiser, 2007). Germany, the largest wind energy producer in Europe, has seen decreasing investment in wind energy beginning in 2004 as a result of an increase in frequency of the Renewable Energy Act review process (Agnolucci, 2006) but is now making a comeback as legislation improves. In Denmark a delay in implementation of a new policy caused the entire wind energy sector to stall (Meyer, 2003).

When it comes to renewable energy a lot of the initial considerations that lead to new investment and new projects being developed relate to viability. European legislation in the field also focuses on viability when discussing the need for the use of green energy certificates as a stimulus for the industry. There are challenges when asserting viability of commercial projects in the renewable energy sector as the companies involved have a clear incentive to overstate cost and underestimate future gains. A great deal of research has been conducted in Europe in the field of viability assessment. Results of this research stand as a basis for European Commission reports that influence and direct policy decisions.

Figure 1. Wind energy generation capacity installed by end of 2013
Source: EWEA (2014), Annual Report 2013. Building a stable future.

1. Romanian legislation dynamics

As part of a EU-wide effort to promote the use of renewable energy sources Romania has passed a series of laws and OUGs (emergency ordinance of the Romanian Government – henceforth referred to as OUG) that form what is generically referred to in the industry as the renewable energy promotion plan. The initial law (220/2008) at the basis of this plan was passed in 2008 and was submitted for approval to the European Commission together with a series of economic analyses regarding the investment and operating costs of wind generators as well as a series of forecasts regarding potential income and profitability in the industry. Based on the European Commission's response, an OUG (88/2011) was issued in order to align the new law with EU requirements and, finally, the renewable energy promotion plan came into force beginning November 1st, 2011. It should also be mentioned that being enforced by OUG, the law (134/2012) which approved OUG 88/2011 was only passed in July 2012 although this does not affect the fact that the renewable energy promotion plan came into force on November 1st, 2011.

One of the key components of the renewable energy promotion plan was that wind energy producers would be entitled to receive two green energy certificates for each MWh produced. On July 1st, 2013, OUG 57/2013 comes into force bringing significant changes to the renewable energy promotion plan. Among these, the most important aspect was that half of the green energy certificates would not be awarded until April 2017. Instead of two certificates per MWh, producers would receive one certificate on delivery and wait to receive the second one in April 2017. The practical implications of this change, since the market for green energy certificates, although regulated, functions as any other market, were that certificates would be in short supply in 2013, bringing their price up, but would be in very large supply in 2017-2018, therefore worth considerably less.

The OUG (57/2013) was approved by law in December 2013, but the law was sent back by the Presidential Administration due to the fact that it breached the Treaty of the European Union with regards to modifications brought to state subsidies needing to be reviewed by the European Commission prior to their enforcement. Based on Romanian law, however, OUG 57/2013 started producing effects despite the fact that its approving law had been sent back to the Parliament.

In December 2013 the Romanian Senate also received a proposal for a new OUG that would impose a price cap on the green energy certificate market at EUR 30 / certificate in order to counteract the fact that certificates were now in short supply. This proposal is still pending at the time of writing of this paper.

Besides the fact that there was a clear case of infringement of European law in the modification of the renewable energy promotion plan there is also a case to be made about compliance with the Decision of the European Commission (4930/2011) with regards to the necessity of green energy certificates in order to ensure viability for green energy projects in the EU. While the decision states that certificates need to be awarded, and half of the originally promised certificates would still be awarded in a timely manner, the case being made by the Romanian Wind Energy Association (David, 2014) relates to the loss of viability of wind energy projects in Romania due to the aforementioned changes in legislation.

The wind energy sector is further affected by another OUG (102/2013) which entered into force on January 1st, 2014. While this OUG does not specifically target the renewable energy sector and is, in fact, a long list of modifications of the Fiscal Code, companies in the wind energy sector are affected significantly by the introduction of a 1.5% property tax on both the wind turbines themselves and their accompanying structures (transformation stations, roads, cables etc.).

The Romanian Fiscal Code has suffered a number of 153 modifications in 5 years, since January 1st, 2009. The introduction of the property tax on special buildings, which refers mostly to renewable energy generation structures, is listed as the second worst policy modification, second only to the 2009 increase of VAT, in the Report of the Businessmen's Association of Romania (Biris, 2014).

2. Understanding the economic model

Based on the internal rate of return computed by Romanian authorities in 2010 in the report sent to the Directorate-General for Competition of the European Commission the average cost of 1 MW wind energy generating capacity installed in Romania was evaluated at EUR 1.57M of which 570000 represent the initial construction and grid connection costs. The IRR established by the European Commission for wind energy is 10.9% for an estimated useful wind farm lifespan of 20 years. This means that each installed MW should pay back the initial investment and earn investors enough profits to enable them to reach the 10.9% IRR over the first 20 years of a project's life. The existence of a European Directive concerned with the viability of wind energy projects, however, does not obligate the EU or national governments to ensure that this IRR is reached.

Table 1. Predicted income and cost per MWh for a Romanian wind energy producer prior to enforcement of OUG 57/2013

	EUR/MWh
Average price/MWh	35.30
Green energy certificate average price	44.12
TOTAL Income	123.54
Production cost	(98.17)
Network connection tariff	(2)
TOTAL Cost	(100.17)
NET RESULT	**23.37**

Source: ANRE (2014) Electricity Price Comparison, RWEA (2014) Letter to the Economic Commission of the Senate, OPCOM (2014) Green Certificate Transaction Results.

The data in *Table 1* is based on information from the National Authority for Regulation in the field of Energy (ANRE), the Romanian Wind Energy Association (RWEA) and the Romanian Electrical Energy and Natural Gas Market Operator (OPCOM). While we can expect costs contained in this estimate to be overestimated, due to the source of the data, it should be taken as such as the information has been verified by the Romanian government prior to the delivery of the report to the Directorate-General for Competition in 2010. The data prior to OUG 57/2013 enforcement shows a profit margin that loosely exceeds the Commission's expected IRR.

By withholding half of the green energy certificates due, the expected net result of a wind energy producer had already gone from sufficient to negative as can be seen in *Table 2* below.

The computation of production costs outlined in *Table 2* is considered to be conservative as depreciation and capital costs are not taken into account. Another variable that has the potential to negatively impact the end result is the actual expected market value of green energy certificates. Wind energy output has a tendency to be at its highest during off-peak intervals and, as a result, prices for certificates will sometimes be 10% smaller than the average or as much as 25% smaller than the average. While this does not change the fact that

the average price was 44.12 EUR/MWh in 2013, one should bear in mind that individual producers with a propensity for off-peak production will have made considerably less money on their green energy certificates and their net results are even less encouraging.

Table 2. Predicted income and cost per MWh for a Romanian wind energy producer after enforcement of OUG 57/2013

	EUR/MWh
Average price/MWh	35.30
Green energy certificate average price	44.12
TOTAL Income	79.42
Production cost	(98.17)
Network connection tariff	(2)
TOTAL Cost	(100.17)
NET RESULT	**-20.75**

Source: ANRE (2014), Electricity Price Comparison, RWEA (2014), Letter to the Economic Commission of the Senate, OPCOM (2014), Green Certificate Transaction Results.

The decrease of the compulsory wind energy quota from 15% to 12% in 2014 translates to an 8 EUR/MWh loss, assuming the price of green energy certificates stays the same. From a market point of view the decrease of this quota would normally translate to a drop in demand and therefore a reduced price. Based on the reduced price we should assume that the actual loss would be 19.2 EUR/MWh. However, correlating the change in quota with the delayed energy certificates we may also face a situation whereby demand for energy certificates is not fully met and an increase in price will actually be registered in the energy certificate market. The degree of uncertainty actually means the error coefficient is high enough to make forecasting irrelevant.

Another clearer, additional cost is a result of the introduction of the 1.5% property tax on special structures which the RWEA estimates at 6 EUR/MWh, based on the tax applied to the energy generation equipment alone. The estimated property tax for the entire range of assets that were previously not taxed, including transformation stations, cables, service roads etc, amounts to 9.3 EUR/MWh. The first, more optimistic scenario is considered in *Table 3* below.

Table 3. Predicted income and cost per MWh for a Romanian wind energy producer after enforcement of OUG 57/2013 and OUG 102/2013

	EUR/MWh
Average price/MWh	35.30
Green energy certificate average price	44.12
Revenue loss due to decreasing wind energy quota to 12% – estimated without accounting for potential certificate price variation	(8)
TOTAL Income	71.42
Production cost	(98.17)
Newly introduced 1.5% property tax	(6)
Network connection tariff	(2)
TOTAL Cost	(106.17)
NET RESULT	**-34.75**

Source: ANRE (2014), Electricity Price Comparison, RWEA (2014), Letter to the Economic Commission of the Senate, OPCOM (2014), Green Certificate Transaction Results.

While actual production costs may differ significantly from one energy producer to another, the net revenue loss resulting from delayed certificates, new property taxes and reduced wind energy quotas is far less debatable, amounting to 58.12 EUR/MWh under the most optimistic scenario. Investment decisions for large scale projects were made based on a EU-wide green energy support program that was introduced by Romanian policy makers and then gradually dismantled. The short run impact on these projects is clearly negative and its dimension is relatively easy to assess.

3. Long term effects

Changes in energy policy are not specific to Romania alone. There are examples of similar policies implemented in other countries in the EU. A notable example from the US are Federal Production Tax Credits, henceforth referred to as PTC. PTC allocation in the US is cyclical, each cycle lasts for two years and the allocation of the next cycle is usually decided only after the previous PTC has ended. This procedure introduces a large degree of uncertainty which is, in some respects, comparable to the type of policy volatility we encountered analyzing the situation in Romania.

Systemic policy volatility, even in cases where its existence is known and it is expected, has been shown to reduce the number of players entering a market due to the required period of accommodation (Bailey, 2008). The same volatility is responsible for reduced expenditure with research & development. Both of these have long reaching effects resulting in loss of opportunity and loss of productivity in the long run.

The existence of a stimulus program in a particular field always entails negative effects on certain aspects of development projects in said field. For instance, the allocation of green energy certificates in the European Union drives prices upwards as turbine manufacturers and other contractors increase their prices knowing that more money is available and there is room to charge more. In a series of interviews conducted in the US, investors highlighted the existence of subsidies as one of the primary drivers of cost during negotiations (Wiser, 2007).

Besides the adverse effect of subsidies on costs they also create a form of dependence. This dependence relates firstly to the viability of projects discussed earlier in the paper. This viability is not a binary variable applicable to green energy projects but rather a degree to which each project is feasible. Allocating one green energy certificate per KWh makes more projects viable, allocating two certificates per KWh enables even more and contributes to encourage development in the field. Studies in the US show that 33% of wind energy projects are viable in the absence of subsidies (Barradale, 2010). Interviews with wind energy top management personnel highlighted the fact that their desire to invest is significant because of the way they perceive the market. This perception is in fact what drives actual investment in the field. Half of in-house utility wind projects in the US would carry on due to this perception even in the absence of subsidies. Although less data is available about the wind energy industry in Romania these same basic principles apply. As outlined earlier a fair amount of cost data is available on the current wind energy situation but there is no data about what the cost of wind energy would look like without a subsidy (Johnston, 2008).

Economic dependence on the renewable energy promotion plan cannot be demonstrated or measured based solely on the short term variations of the level of support. A long break with complete absence of a support plan is necessary in order to assess the real number of projects that would be economically viable without the support plan (Barradale, 2010).

Typical measures designed to encourage investment usually fall under a few broad categories, including fixed pricing for generated current and fixed quotas for certain types of

energy sources but also special facilities provided for renewable energy producers, like more permissive accelerated depreciation methods for fixed assets. Fixed prices per KWh or minimum price floors are used in many countries across the EU. In Romania, where the electricity market is thoroughly regulated, the price per KWh is heavily influenced by the policy maker and the regulating agency. Despite the fact that policy makers have such a broad range of resources at their disposal, it is the lack of long term coordination that renders most efforts ineffective. There is also little local application of information from studies carried out worldwide with regards to which measures are most effective. For instance it has been found that the application of a minimum quota for energy from renewable sources is more effective than green energy certificates (Langniss, 2003). Although both types of incentives are used and both have been reduced through the latest amendments put forward by lawmakers, revenue from green energy certificates has only been delayed while 20% of the minimum quota for this year has been forfeit.

Conclusions

Changes in public policy have a direct measurable effect on the success of ongoing projects. Of all possible policy modifications, changes in fiscal policy are probably the most efficient way to encourage or thwart development. As shown, development is greatly affected by such changes even when they are largely predictable. Under a scenario of predictability deviations are usually registered in the short run while the overall, long term development plans tend to remain unaffected. Unpredictability, on the other hand, has devastating effects on development, not because of its short term disastrous effects, but mostly due to the long term implications of numerous, frequent, unforeseen modifications in fiscal policy. Loss of confidence in the system on the part of investors hinders long term development in ways that are difficult to predict and nearly impossible to reverse.

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