

Renewable Energy Strategies in European Context

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Abstract

Within the European Union support schemes contributes to secure, sustainable and competitively priced energy for Europe, by providing actions to promote new and renewable energy sources. The Programmes tries to tackle non-technological barriers to greater use of new and renewable energy sources, contributing to achieving the objectives of EU energy policy and to implementing the Lisbon Agenda.

Promoting renewables in Romania has to consider both the European strategic targets and the Romanian present state and future development.

Keywords: *renewable energy, Europe, european programs.*

1. Introduction

Renewable energies such as wind power, solar energy, hydropower and biomass can play a major role in tackling the twin challenge of energy security and global warming because they are not depletable and produce less greenhouse-gas emissions than fossil fuels [1,2].

Since the energy crises of the 1970s, several industrial nations have launched programmes to develop renewable energy solutions, but the return of low oil prices prevented renewable energies from picking up on a large commercial scale.

Renewable energies today cover 13.1% of global primary-energy supply and 17.9% of global electricity production (IEA, 2007). The IEA's World Energy Outlook 2006 foresees in its Alternative Policy Scenario that the share of renewables in global energy consumption by 2030 will remain largely unchanged at 14%. Renewables in electricity generation are expected to grow to around 25%, according to the IEA.

Past EU policy developments include:

- **1997:** Commission White Paper 'Energy for the future: renewable sources of energy - White Paper for a Community Strategy and Action Plan', sets EU target of increasing the share of renewable energy to 12 per cent of total energy consumption by 2010.
- **2001:** EU adopts the Directive on the Promotion of Electricity produced from Renewable Energy Sources ('Renewables or 'RES-E' Directive'). The directive sets an EU-wide target of 21% of renewables share in electricity production by 2010.

- **2003:** EU adopts the Biofuels Directive setting "reference values" of 2% market share for biofuels in 2005 and 5.75% share in 2010.
- **2006:** European Parliament calls for 25% target for renewables in EU's energy consumption by 2020.
- **2007:** Commission presents "Renewable Energy Roadmap" as part of its "energy-climate change" package.

2. Use of renewable energy sources in Europe

A proposal for a new EU directive, published on 23 January, mandates each member state to increase its share of renewable energies - such as solar, wind or hydro - in an effort to boost the EU's share from 8.5% today to 20% by 2020. A separate target to increase biofuels use to 10% of transport fuel consumption is to be achieved by every country as part of the overall EU objective [3].

To achieve these objectives, every nation is required to increase its share of renewables by **5.5% from 2005 levels**, with the remaining increase calculated on the basis of per capita gross domestic product (GDP).

EU countries are free to decide their preferred 'mix' of renewables in order to take account of their different potentials, but must present national action plans (NAPs) outlining their strategies to the Commission by 31 March 2010. The plans will need to be defined along three sectors: electricity, heating and cooling and transport.

While only the 2020 target is legally binding, the Commission has indicated that it could pursue earlier legal action in cases where a member state's progress is so limited that it is clear the final target cannot be reached.

The Commission's proposal allows for the virtual trade in renewable energies involving Guarantees of Origin (GOs), which certify the renewable origin of electricity produced. This provision already features in existing EU renewables legislation, but has hardly been utilised, according to the Commission.

Under the system, member states may invest in renewable energy production in another member state in exchange for GOs, which can be counted towards the renewables target. But the Commission has attached the condition that a member state must have already reached its own interim target before being allowed to receive investments and transfer GOs to another member state.

Physical trade in renewable energies is permitted and encouraged in the EU's internal market, but currently accounts for less than 6% of the electricity traded between EU member states, according to the European Renewable Energy Council (EREC).

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Brussels has come under acute pressure from green politicians, NGOs and the scientific community to provide robust sustainability criteria to ensure that the 10% biofuels target does not lead to ecosystem loss, deforestation, population displacement, food price increases and even higher CO₂ output.

The Commission's text includes the following criteria:

- Land use - old forest with no or limited human intervention cannot be used for biofuels cultivation, nor can 'highly biodiverse grasslands', or lands with a 'high carbon stock' like wetlands or 'pristine peatlands';
- CO₂ impact - the overall greenhouse gas (GHG) savings from biofuels production must be at least **35%** in order for cultivation to be considered sustainable.

The Commission will put forward sustainability criteria for energy use of biomass by the end of 2010.

3. The energy strategy in Romania

In 2007 the Romanian government approved a long term Energy Strategy, building up on the National Energy Strategy on Medium Term (see below).

The government's strategy emphasizes on :

- increasing energy efficiency
- boosting renewable energy
- diversifying import sources and transport routes
- modernising lines
- protecting critical infrastructure.

To achieve its policy objectives in the electricity sector, the strategy also recommends the creation of a national power sector champion. The state will hold 25-40 % of the new holding company, investment fund Fondul Proprietari will hold 20 %, and the remaining shares will be listed on the Bucharest stock exchange.

The strategy aims at creating public private partnerships in different sectors, for example in the nuclear field, such as building two additional units (3 and 4) of Romania's nuclear power plant in Cernavoda.

Romania's overall goal is to become an important electricity exporter and to double the power output to approximately 100 TWh by 2020, which will be more than domestic consumption.

Furthermore Romania is focusing on renewable energies and plans to increase the share up to 33 % of overall power consumption by 2010 [3].

Currently Romania's market is characterized by the implementation of two seemingly opposite sets of actions, one aimed at ensuring Romania's transition to the market economy and the achievement of economic growth, while the other is targeting the environmental protection through promotion of energy efficiency and use of renewable energy sources for electricity generation. However, a closer look at the measures implemented in order to decrease the negative impact on environment of the activities in the energy sector, reveals that the actions adopted or which are to be adopted in the near future are all directed to achieving the same goal:

to ensure the premises for Romania's economic growth and competitiveness on the European market. The increased awareness regarding the depletion of energy sources in the context of a significant climate change due to greenhouse gas emissions, lead to the escalation of the number of those calling for the implementation of sound policies in order to achieve sustainable development at both national and European level. The most poetic argue that governmental officials should not ignore the fact that "we have not inherited the resources from our parents, but simply borrowed them from our children", while the most pragmatic, find arguments in technical studies performed for the assessment of the climate change implications on the economy and, ultimately, on the day-to-day life of each individual. At European level, the supporters of the sustainable development approach gained a new argument after the publication of the 2006 Stern Review on the Economics of Climate Change, a study performed in an attempt to quantify the economic implications of the climate change, while stressing the emergency to take action in dealing with this matter. In recent years, energy efficiency and harnessing renewable energy resources for electricity generation have gained an increased weight in defining Romania's development and economic policies. Several factors contributed to this increase, including Romania's efforts to accede to the European Union (EU) and to decrease the existing economic differences compared with EU Member States, as well as the obligations assumed through the ratification of the 1992 United Nations Framework Convention on Climate Change (UNFCCC)¹ and of its 1997 Kyoto Protocol.

3.1. Romania's strategic objectives in the area

During 2003-2005, in order to address the need to define state policies in the field, the Romanian Government adopted several national strategies, setting forth the general principles and targets on harnessing renewable energy sources, energy efficiency and climate change. The National Strategy on Harnessing Renewable Energy Sources³ takes an overall look at the potential of renewable sources in Romania and sets forth the main objectives to be reached by the country in the near future. In defining such objectives, the Romanian authorities acknowledged the proposals advanced at European level, including the strategic goal of achieving at EU level a 12% penetration of the renewable energy sources in the overall consumption of primary sources by the year 2010, as set forth in the Commission's 1997 White Paper for a Community Strategy and Action Plan on renewable sources of energy, as well as a 22.1% indicative share of electricity generated from renewable energy sources, in the overall Community electricity consumption by 2010, as set forth in Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market.

Based on the above mentioned guidelines, but also taking into consideration Romania's renewable sources potential for solar, wind, water and geothermal energy, the said strategy establishes as target for Romania the generation of 33% of the overall electricity consumption from renewable sources by the year 2010⁴. The main objectives set forth under the strategy refer to the integration of renewable energy sources in the structure of the national energy system, the promotion of private investments and facilitating the access of foreign capital on the renewable sources' market, ensuring the independence of national economy's energy consumption and the premises for Romania's participation on the European green certificates market. The total estimated costs for achieving the investment projects proposed under the strategy amount to EUR 1,300 million for the period 2003-2010 and to EUR 1,400 million for the period 2011-2015.

The National Strategy on Energy Efficiency sets forth the objectives concerning energy efficiency for the period up to the year 2015. The main purpose of the strategy is to identify the possibilities and means to increase energy efficiency at all levels of the energy chain, by implementing specific programs in order to reach its ultimate goal: the increase of primary

energy efficiency by 30% to 50% by the year 2015. Failure to implement a firm energy policy promoting energy efficiency would increase the primary energy consumption associated with the estimated evolution of the Gross Internal Product by 30% by the year 2015, which in turn would lead to a decrease of Romania's energy independence, evaluated in the year 2004 at 70%. The strategy also attempts to identify possible financial sources for meeting the estimated financial effort associated with the medium target increase of energy efficiency (40%), of EUR 2.7 billion. The savings in the acquisition of primary resources as a result of reaching the 40% target increase in energy efficiency are estimated at EUR 3.4 billion, to which EUR 215 million would add from trading carbon dioxide (CO₂) emissions. The main public financial sources referred to under the strategy, include allocations from the state budget and the local budgets, the grant of financial incentives from the state budget and public-private partnerships. The National Strategy on Climate Change for the years 2005-2007 is one of the most important strategies to be adopted in the field. Although the strategy refers to a short period of time (from 2005 to 2007) a longer perspective (until the end of the first commitment period under the Kyoto Protocol scheduled for 2012) was considered in the evaluation of the strategy's impact.

The strategy's objectives include: (i) meeting the commitment assumed by Romania under the Kyoto Protocol, (ii) the approximation and implementation of the EU directives on emission allowance trading and (iii) ensuring a legal and institutional framework for dealing with climate change and participating in the flexible mechanisms regulated by the Kyoto Protocol, while increasing awareness of the risks entailed by climate change. Romania was the first UNFCCC's Annex 1 Party to ratify the Kyoto Protocol in 2001, and, thus, committing itself to reduce greenhouse gas (GHG) emissions by 8% in the first commitment period 2008-2012 comparing with the base year (1989). This commitment threshold also allows Romania to meet its obligations under the EU directives regarding the decrease of GHG emissions.

The strategy also establishes the adoption of a National Action Plan on Climate Change. In drawing both the strategy and the National Action Plan on Climate Change, Romania received assistance from the Danish Environmental Protection Agency. The Action Plan contemplates detailed analysis on the requirements for meeting each of the objectives provided by the strategy, including costs estimates for each action. In addition to more firmly defining its policies in this sector, Romania has recently started to build the legal and institutional frameworks necessary for implementing certain mechanisms designed by the international and European communities in order to get the market players involved in achieving the national strategies' general objectives. Below is a brief analysis of the main mechanisms currently available for reaching the strategic objectives adopted by Romania that impact on energy efficiency, the promotion of renewable energy sources and climate change.

3.2. Mechanisms promoting electricity generation from renewable sources

Starting with 2003, Romania adopted various regulations for promoting electricity generation from renewable sources. The regulations apply to both energy generated from renewable sources (such as wind, geothermal, hydro, biomass, waves) and energy generated from hybrid plants, using renewable and conventional sources. In order to benefit from the facilities provided by law, the generators using renewable sources have to obtain a certificate for the guarantee of origin attesting the provenience of the electricity. The regulations provide the principle of non-discriminatory access to networks of generators using renewable sources and the operators' obligation to guarantee the transmission and distribution of the electricity generated from renewable sources, in so far as such does not endanger the networks' viability and safety. In addition, the priority production is introduced on the regulated wholesale energy market with preference. In order to meet the demand for electricity generated from renewable sources, the regulators have established a system of mandatory green quotas, representing the

proportion of electricity generated from renewable sources out of the aggregate gross domestic electricity consumption combined with the trading system for green certificates.

All electricity suppliers have the obligation to acquire electricity from renewable energy sources (referred to as priority production) at least in the quotas indicated by law.

The mandatory quotas have been established until 2010 in line with the target assumed by Romania during the negotiations for EU accession, starting from 0.7% for 2005 and ending at 8.3% for 2010-2012. Such annual quotas may be amended during 2005-2007, in the first decade of December, in case the capacity in the facilities for generation of electricity from renewable sources cannot cover the demand of green certificates, as set forth by law.

Indeed, the Romanian Energy Regulatory Authority (ANRE) approved a reduction of the mandatory quota to 2.65% of the annual quota for 2005 and to 2.38% of the annual quota for 2006. In case suppliers fail to acquire the certificates in order to meet the mandatory quotas, they will be required to pay 1.5 times the maximum amount provided by law for each nonpurchased certificate for the period 2005-2007 and twice said amount starting from 2008 (currently, the maximum value of a green certificate is of EUR 42). For generators using renewable resources, the advantage of the green certificates mechanism consists in the fact that the amounts obtained from the suppliers are used by ANRE for acquiring the certificates issued to the generators and not traded or are redistributed to generators based on the number of green certificates issued and type of technology used in the generation process.

4. Conclusions

European Union support schemes contributes to secure, sustainable and competitively priced energy for Europe, by providing actions to promote new and renewable energy sources. Promoting renewables in Romania has to consider both the European strategic targets and the Romanian present state and future development.

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Strategii privind sursele de energie alternativă în context european

Rezumat

In cadrul Uniunii Europene, programele-suport contribuie la producerea de energie sigura si competitiva, pentru tarile europene, oferind cai de actiune pentru promovarea surselor alternative de energie. Aceste programe vin in intampinarea barierelor non-tehnologice ce se afla in calea folosirii pe scara mai mare a energiilor alternative, contribuind la atingerea obiectivelor UE si la implementarea obiectivelor stabilite la Lisabona.

Promovarea susrelor alternative in Romania trebuie sa tina cont atat de strategiile europene cat si de starea de fapt din Romania si posibilitatile specifice de dezvoltare.