

RENEWABLE ENERGY STRATEGIES: WHERE EUROPEAN UNION HEADED?

RADULESCU IRINA GABRIELA

Associate Professor, Faculty of Economic Sciences, Petroleum-Gas University, Ploiesti, Romania
iri_radulescu@yahoo.com

POPESCU CATALIN

Full Professor, Faculty of Economic Sciences, Petroleum-Gas University, Ploiesti, Romania
cpopescu@upg-ploiesti.ro

Abstract

The states from European Union must take advantage from renewable energy sources in order to revive the economy. Climate change creates new jobs and could reduce energy imports which would stimulate the economy of those states.

The European Union should support research in the field, apply more efficient policies in energy, and create economies of scale to get an integrated European energy market in which the main actors can reduce the cost of production of renewable energy. In addition, it is possible to use the comparative advantages of the Member States and not only, like Greece, through solar energy, Southern Mediterranean, through distribution networks interconnections with EU, Russia and Ukraine, through biomass and the North Sea, through wind energy.

This paper refers to the evolution and trends of the renewable energy sources and presents some scenarios of it.

Keywords: *renewable energy, European Union, energy policy*

JEL Classification: *Q01, Q20, Q40*

1. Introduction

In the energy field, renewable energy is considered as the main factor for improving security of supply and reducing emissions of greenhouse gases. Therefore, energy policy has as its main objectives the energy commodity prices and the need for environmental conservation.

The renewable energy sector demonstrates its ability to generate cost savings; the main condition is that energy policy has to ensure the appropriate development framework. Renewables sources such as wind and solar panels are increasing, with annual growth rates of two digits. The costs are decreasing which allowed a growing portfolio of renewable energy technologies to become competitive. New technologies in the hydro and geothermal energy field are often fully competitive on the energy market.

The European Union has been working continually to promote green energy. The beginnings of renewable energy concerns are found in the Maastricht Treaty that promotes sustainable growth to protect the environment, in the Amsterdam Treaty that has added the principle of sustainable development to the EU objectives and in the "Europe 2020 Strategy" for economic development in the European Union.

In addition, the European Union adopted a series of directives in the field of renewable energy (see box 1).

2001 - Directive for the Promotion of Electricity from Renewable Energy Resources – RES
2004 - Directive concerning energy and heat production in CHT system
2005 - Action plan for biomass – COM (2005) 628
2007 - Renewable Energy Road Map - Renewable Energies in the 21-st century; building a more sustainable future - EU
2009 - Directive on renewable energy (2009/28/EC)

Box 1 Some EU directives in the renewable energy field

The European Union has set several objectives to be achieved by 2020 (Heller, Deng, and van Breevoort, 2012):

- ✓ 20% renewable energy share of energy consumption and 10% share of renewable energy in transport sector [5];
- ✓ 20% emission reduction of GHG compared to 1990;
- ✓ 20% of primary energy savings [12].

In 2012, the European Commission adopted a different directive called „*Energy from renewable sources: a major player in the European energy market*” through which the member states wanted to stimulate economic development and to increase competitiveness due to diversification of energy supply by promoting renewable sources. This new target requires efforts from the European Union by [1]:

- ✓ promoting new cooperation mechanisms in order to achieve national objectives because renewable energy trade;
- ✓ the integration of renewable energy on domestic market;
- ✓ providing incentives for investments in electricity production;
- ✓ the regulation of cooperation in energy field in the Mediterranean region.

The first report of the European Commission regarding the renewable energy was published in March 2013. According to the report, most Member States have experienced a significant increase in renewable energy consumption (about 12.7% from primary energy consumption). Some states have reached interim targets, except a number of 15 Member States (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Greece, Spain, Finland, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, the Netherlands, Portugal, Romania, Slovenia, United Kingdom) who did not meet the 2010 indicative targets for the share of renewable energy in the energy mix agreed under Directive 2001/77 / EC and 22 Member States (Austria, Cyprus, the Republic Czech, Greece, Finland, France, Italy, Luxembourg, Malta, Poland, Romania, Sweden, Slovenia, Slovakia, UK) who did not meet the indicative target for 2010 of 5.75% in the transport sector established under Directive 2003/30 /EC. [2]

2. Progress of renewable energy towards EU 2020 targets

In 2000, the energy consumption from the renewable sources was 7.4% from the gross final energy consumption and in 2010 there was an increase of about 13%. Germany is the largest producer of renewable energy and Sweden has the largest share in renewable energy (see table 1).

Table 1. RES shares of the gross final energy

%	2006	2010	2011	2012
EU-28	9.3	12.5	12.9	14.1
BE	2.7	5.0	5.2	6.8
BG	9.7	14.4	14.6	16.3
CZ	6.4	9.3	9.3	11.2
DK	15.9	22.6	24.0	26.0
DE	7.7	10.7	11.6	12.4
EE	16.1	24.6	25.6	25.8
IE	3.1	5.6	6.6	7.2
EL	7.2	9.8	10.9	13.8
ES	9.2	13.8	13.2	14.3
FR	9.5	12.7	11.3	13.4
HR	12.8	14.3	15.4	16.8
IT	6.4	10.6	12.3	13.5
CY	3.3	6.0	6.0	6.8
LV	31.1	32.5	33.5	35.8
LT	17.0	19.8	20.2	21.7
LU	1.5	2.9	2.9	3.1
HU	5.1	8.6	9.1	9.6
MT	0.4	0.4	0.7	1.4

NL	2.6	3.7	4.3	4.5
AT	25.6	30.8	30.8	32.1
PL	7.0	9.3	10.4	11.0
PT	20.7	24.2	24.5	24.6
RO	17.1	23.2	21.2	22.9
SI	15.6	19.2	19.4	20.2
SK	5.9	9.0	10.3	10.4
FI	30.1	32.4	32.7	34.3
SE	42.6	47.2	48.8	51.0
UK	1.6	3.3	3.8	4.2

Source: Eurostat (2012)

Making a comparison between the three important energy sectors we can observe that the building sector has the highest renewable energy consumption because of the consumption of biomass for heating.

A significant increase of RES share in total consumption for the period 2006 - 2010 was observed in Spain (from 9% to 13.8%), Romania (from 17.1% to 23.4%), Estonia (from 16.1% to 24.3%) and Sweden (from 42.7% to 47.9%). Regarding Romania, this is very close to the 2020 target (achieving a 24% renewable energy in total energy consumption).

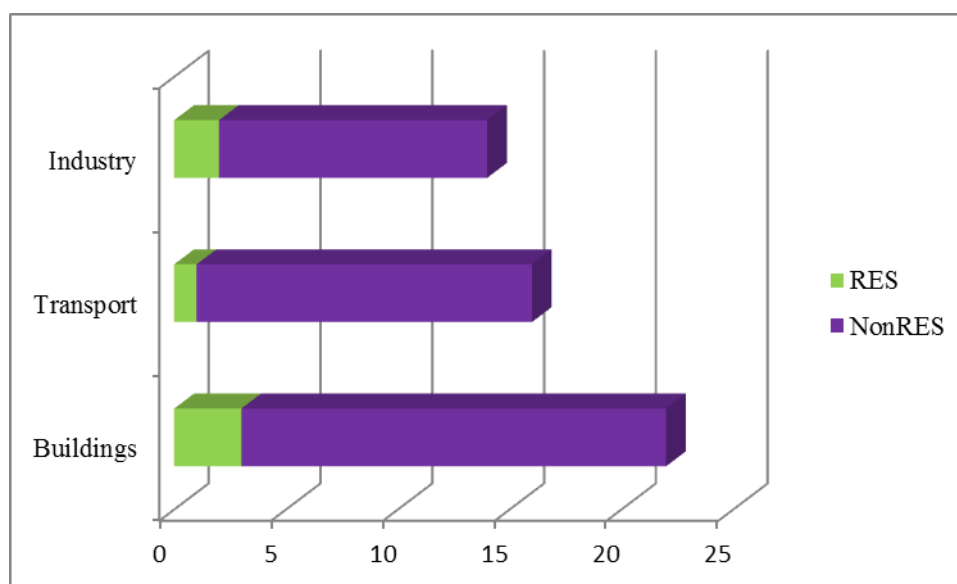


Figure 1 RES consumption in the EU 27 in 2010 (EJ)

Source: Eurostat 2012

In the United Kingdom, the total contribution of renewable energy (8.7% from electricity, 2.2% from heating and 2.9% from transport fuels) in total energy consumption was 3.8% in 2011. The main target of this country is to achieve a share of 15% into all energy from renewable sources; the United Kingdom will try to reach a 12% share of renewable energy for heating and one of 10% for transport [8].

In France there was a slight increase in renewable energy in 2011 which reach a value of 16.4% from total energy consumption. Therefore, the French government proposed a plan to stimulate the development of renewable energy: in 2020, this will represent 23% of total energy [4].

Sweden represents a model in renewable energy area due to large investments made in the field which have as result a 47% share of renewables in total energy consumption. In the future, Sweden aims to become a de-carbonization economy that is based on the principles of market economy, on the technological innovation and on the benefits obtained by consumers. This will lead to the creation of a common market in the Nordic region, to the regional development of renewable energy and to the introduction of innovative technologies that will enhance economic competitiveness and security of supply [7].

In Germany the government has proposed, as a strategy, the building of new transmission lines to deliver renewable energy and the connection of wind farms from the North Sea to the networks from the continent. In Italy,

there was a sustained increase of renewable energy resources as a result of incentives provided. The hydro occupies an important place in the energy mix.

3. Scenarios in Renewable Energy

Renewable energy sources account for about 17-18% of global energy, of which 9% is given by traditional biomass and the remaining of 8% from modern renewables [3]. The traditional part has remained relatively stable, while the modern part has known an upward trend. Over time several different organizations have done many projections regarding the renewable energy. There was a more rapid growth than projected, which required the emergence of new scenarios in which the share of renewable energy sources is much higher.

“Sustained Growth” – Shell oil company

“Energy to 2050: Scenarios for a Sustainable Future”- International Energy Agency

“Exemplary Path”- German Advisory Council on Global Change

“Energy Technology Perspectives” - International Energy Agency

“Energy Revolution” – Greenpeace and European Renewable Energy Council

Box 2 Some renewable energy scenarios

The new renewable energy scenarios can be divided into three categories [6]:

- ✓ Conservative renewables – are published by oil companies and show an under 15% share by 2030-2040; for example: BP’s Energy Outlook 2030 (2012), Exxon Mobil’s Outlook for Energy: A View to 2040 (2012).
- ✓ Moderate renewables – predict long-term renewable energy shares (from 25% to 40%); for example „450 Carbon-Stabilization Scenario” shows 27% share by 2035, „2DS Scenario” published by International Energy Agency (2012) shows 41% share by 2050.
- ✓ High renewables – project 50 – 90% energy shares of renewables by 2050.

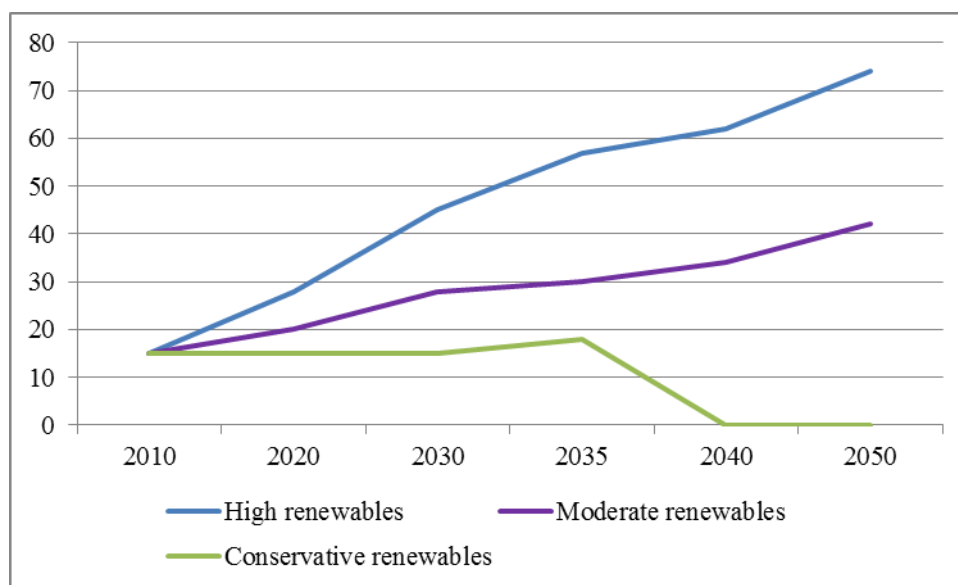


Figure 2 Scenarios to 2050 – RES share of total global energy (%)

Source: Renee Heller, Yvone Deng, Pieter van Breevoort, Renewable energy: a 2030 scenario for the EU, ECOFYS, Netherlands, 2012

Also, in table 2 we can see several sectoral projections for the period 2030 to 2050.

Table 2 Renewable Energy Scenarios

Scenario	by year	electricity	heat	transport
By 2030-2040				
ExxonMobil Outlook for Energy: A View to 2040 (2012)	2040	16%	-	-
BP Energy Outlook 2030 (2012)	2030	25%	-	7%
IEA World Energy Outlook (2012) “New Policies”	2035	31%	14%	6%
IEA World Energy Outlook (2012) “450”	2035	48%	19%	14%
Greenpeace (2012) Energy [R]evolution	2030	61%	51%	17%
By 2050				
IEA Energy Technology Perspectives (2012) “2DS”	2050	57%	-	39%
GEA Global Energy Assessment (2012)	2050	62%	-	30%
IEA Energy Technology Perspectives (2012) “2DS High Renewables”	2050	71%	-	-
Greenpeace (2012) Energy [R]evolution	2050	94%	91%	72%
WWF (2011) Ecofys Energy Scenario	2050	100%	85%	100%

Source: REN21. (2013), Renewables Global Futures Report (Paris: REN21)

4. Conclusions

The use of renewable energy has several advantages in economic, social and environmental dimension like:

- ✓ stimulates sustainable economic growth that it can be regenerated;
- ✓ provide new opportunities for employment in the EU;
- ✓ has a minimal negative impact on the environment.

As disadvantage we mention that there is no certainty of supply given that renewable energy is often dependent on climatic conditions; that’s why it is recommended to use several types of sources. We must not forget the high costs generated by renewable energy which depends largely on the private sector. Therefore, there must exist reliable and stable aid schemes, a simple administrative system and easy access to capital. By adopting the „Europe 2020 Strategy”, the European Union shows that Member States need to secure energy security through the use of renewable energy.

5. References

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