

RENEWABLE RESOURCES PROMOTION BY SUPPORT MECHANISMS

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ABSTRACT

The energy from renewable sources complies with several strategic objectives of the EU policy such as environment negative impact reduction (conformation to the provisions of Kyoto Protocol approved on March 5, 2002), increase of the security in terms of energy supply and competitiveness enhancement. The main concern, especially on medium and long term, is the production of electrical and thermal energy based on renewable sources. In order to promote the renewable energy resources, the support mechanisms to promote an increase of these resources use to produce heat and hot water should be considered among other measures. A number of actions including legal facilities for the population to encourage buying, installing and using of heating and domestic hot water equipments that use renewable energy resources have been undertaken at regional level aiming to promote renewable energy production and to improve the air, water and soil quality. By the program "Casa Verde (Green Home) – individuals", the applicants who meet certain conditions receive grants to replace or supplement the traditional heating systems with systems that use renewable resources.

KEYWORDS: *renewable energy, support mechanisms, subsidies*

JEL CLASSIFICATION: Q42

INTRODUCTION

The use of renewable energy is fundamental to pass to an economy with low carbon emissions, representing a priority within the European Union energy strategy.

The energy from renewable sources complies with several strategic objectives of the EU policy such as environment negative impact reduction (conformation to the provisions of Kyoto Protocol approved on March 5, 2002), increase of the security in terms of energy supply and competitiveness enhancement.

The need to transform the energy sector in one without carbon emission and also to reduce the energy dependence led to the adoption of the Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market.

The inadequate progress rate of the targets achievement agreed within this document and also the need to continuously encourage the renewable sources sector development in all EU Member States reoriented the European policy through the issuance of a new directive, namely Directive 2009/28/EC, that grounds a decisive action of the EU in this field establishing legal mandatory national objectives instead of the guiding targets from the previous Directive, referring to the achievement of 20% energy from renewable sources until 2020.

As regards Romania, our country aligned with the EU Member States, adopting the EU energy policy inclusive the objective to promote the energy renewable source.

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Lately, Romania increased the renewable sources use actions due to the fact that this type of energy is “clean” and represents a real alternative to the energy produced from fossil fuels and also because it contributes to the development and integration within the economic circuit of some isolated and disadvantaged areas.

The main concern, especially on medium and long term, is the production of electrical and thermal energy based on renewable sources.

The energy renewable sources potential could theoretically be represented by the maximum value, estimated through measurements and evaluations, existing in a geographical area and that could be capitalized, respectively by the energy that could be obtained from these sources taking into account the technological and economical conditions of the moment.

Romania disposes of important renewable resources energy potential. But the expendable potential of these resources, at this time, is much lower due to the technological limitations, economic efficiency and environment constraints.

Table 1- The estimated renewable resources energy potential, for Romania

Source	Yearly potential
Solar energy	60.0 PJ / year 1.2 TWh
Wind power (theoretic)	23.0 TWh
Hydropower (below 10 MW)	36 TWh 3.6 TWh
Geothermal energy	7.0 PJ
Biomass and biofuel	318 PJ

Source: The energy national strategy of Romania during 2007-2020

In order to promote the renewable energy resources, the support mechanisms to promote an increase of these resources use to produce heat and hot water should be considered among other measures. A financial support materialized in subsidies, tax rebates, favourable conditions loans from banks, facilities granted by law, subject to legal conditions on state aid is also needed. Unfortunately, these support mechanisms were relatively limited in Romania, due to economic constraints.

The energy strategy of Romania during 2007 – 2020 includes a separate chapter regarding the use of renewable resources at rural level. In these areas there is a diversity of such sources that could be used for electric and thermal energy supply of urban or rural zones, namely:

- **biomass**, fuel that can be used both for space and water heating and for cooking;
- **geothermal energy**, that can be used for space (buildings, greenhouses, aquaculture) and water heating, on the condition that these sites to be within a distance of less than 35 kilometers from the place of extraction;
- **solar energy**, that can be used mainly to obtain household hot water (heat production);
- **wind energy**, respectively wind turbines that can be used to obtain electricity in hard to reach not-electrified areas.

A required investment need of 1.800 million euros is estimated by the renewable energy sources strategy for 2006 – 2015 period.

A number of actions including legal facilities for the population to encourage buying, installing and using of heating and domestic hot water equipments that use renewable energy resources have been undertaken at regional level aiming to promote renewable energy production and to improve the air, water and soil quality.

One of these actions resulted in the “Program for the installation of renewable energy heating systems, including the replacement or supplement of the conventional heating systems” that is a program for the population also known as the Program “Casa Verde” (“Green Home”).

This support scheme is conducted under the authority of the Ministry of Environment and Forests, being financed by the Environmental Fund whose income represents government revenue from taxes and contributions according to their legal regime.

The program is annually carried, depending on the number of positions allocated by the Ministry of Environment and Forests.

By the program "Casa Verde (Green Home) – individuals", the applicants who meet certain conditions receive grants to replace or supplement the traditional heating systems with systems that use renewable resources.

The installation of the solar panels, of the heat pumps – except the air conditioning - and of the heating plants based on pellets, briquettes, wood chips or any kind of vegetable, farming, forestry or forest products scrap and waste is funded.

The incurred expenses are those made with the acquisition, installation and commissioning of the facilities and also the VAT.

It was agreed that the amounts allocated for each type of plant to be the following:

- up to 6000 lei for solar panels;
- up to 8000 lei for heat pumps – except the air conditioning equipment;
- up to 6000 lei for heating plants based on pellets, briquettes, wood chips or any kind of vegetable, farming, forestry or forest products scrap and waste.

Given the systems that use renewable resources subsidized by the program "Casa Verde (Green Home) - Individuals", the following considerations can be made:

1. **Thermal or photovoltaic solar panels** represent for Romania the most spread system for energy conversion of solar radiation into thermal energy or electricity. Solar energy is used mainly for domestic hot water preparation and heating.

Solar radiation level is higher in Romania than in Western European countries with tradition in the use of solar systems. Thus, on more than half of our territory, the average annual energy has values between 1100-1350 kWh, depending on the season.

Given the performance of thermal solar and photovoltaic installations suitable for any heat or electricity application, in general any sunny area may be appropriate for solar applications. A thermal solar collector functions in normal efficiency conditions with a productiveness of 40 - 90% from March to October (*Leca and Musatescu, 2008*).

The photovoltaic solar panels used mainly in the urban areas, have a productiveness of about 15-20% and a life expectancy of over 25 years. A photovoltaic panel with an area of 1 square meter, with an installed power of 120 W, can provide about 130 kWh / year (*Leca and Musatescu, 2008*).

As the panel efficiency is higher, the greater production costs and therefore the selling price per unit of output increases.

However, the initial performances of these solar collectors deteriorate in time, with a bound level of 80% productiveness after 25 years.

Since solar energy is competing with biomass, the main demand of hot water obtained by solar energy exists in the urban areas.

Given that globally significant amounts have been invested in the research and development of the new technologies aiming to increase the efficiency of solar installations and also for projects and mechanisms to support the use of renewable resources, it is estimated that solar applications will progress in the near future.

2. Another category of facilities agreed by the program "Casa Verde (Green Home) - individuals" is the **heat pumps** that use solar energy stored in water, soil and air as ecological heat. Used for heating and hot water, they provide effective technical possibilities for saving energy and reducing carbon dioxide emissions.

The most heat pumps use electricity as drive energy. Reducing carbon dioxide emissions depends on how this drive energy is produced and on the technology which replaces these pumps in the traditional heating systems. Even if the drive energy is obtained from fossil fuels, carbon dioxide emissions can be reduced by 30 - 50% compared to the conventional boilers. The annual energy consumption when using heat pumps is much lower than in the case of conventional heating systems, so the annual energy costs will be implicitly lower.

Although the heat pumps require relatively high initial investment and special installation conditions, they present the advantages of being clean and of low operating cost.

3. *Domestic thermal plants that use biomass (biomass boilers)* are also included in the Program "Casa Verde (Green Home) – individuals" for grants.

It is known that Romania has a high biomass potential useful to produce heat, represented by:

- scrap resulting from logging and firewood;
- wood waste (bark, sawdust, etc.);
- agricultural wastes (straw, corn stalks, vine ropes, etc).

The biomass is mainly used for heating and hot water in the rural areas where the population usually use the local biomass energy resources. Biomass covers about 7% of the primary energy demand and 50% of Romania's renewable resource potential.

According to data from the Institute of Wood Industrialization, the geographic distribution of solid biomass resources with energy potential is uneven. Thus, in terms of forest resources, there are rich counties (Suceava – 647 thousand cubic meters, Harghita – 206.5 thousand cubic meters, Neamt – 175 thousand cubic meters, Bacau – 132 thousand cubic meters) and poor counties (Constanta – 10.4 thousand cubic meters, Teleorman – 10.4 thousand cubic meters; Galati – 10.4 thousand cubic meters). In terms of agricultural resources, there is also a diverse spreading, from the richest counties in agricultural biomass (Timis – 1432 thousand tons; Calarasi – 934 thousand tons, Braila- 917 thousand tons) to the poorest ones (Harghita - 41 thousand tons, Covasna – 73 thousand tons, Brasov - 89 thousand tons).

RESEARCH METHODOLOGY

The study starts with data series analyses provided by the Ministry of Environment and Forests regarding the situation of the files submitted for funding under the program „Casa Verde (Green Home) – individuals ‘’ in 2010.

The study proposes the way subsidies are attracted provided by the Ministry of Environment and Forests for the replacement or supplementation of traditional heating systems with systems that use renewable resources.

It also proposes to discover the type of heating systems preferred by individuals on a counties scale. After the statistical processing of the data provided by the Ministry of Environment and Forests regarding the situation of the files submitted for funding under the program "Casa Verde' (Green Home) – individuals" in 2010, a series of information were obtained that allow the following results:

Table 2. The situation fo the files submitted for funding under the „Program Casa Verde(Green Home) individuals 2010”

	Counties	Residence	Approved 6000 RON	Approved 8000 RON	The amount finally approved	Rejected files	The amount of funding initially allocated
1	ALBA	382747	517	2	3118000	73	1941895
2	ARAD	461791	449	8	2758000	42	2342930
3	ARGES	652625	309	3	1878000	105	3311140
4	BACAU	706623	469	2	2830000	33	3585103
5	BIHOR	600246	817	101	5710000	94	3045392
6	B-NASAUD	311657	283	5	1738000	64	1581214
7	BOTOSANI	452834	339	0	2034000	26	2297486
8	BRAILA	373174	103	0	618000	9	1893325
9	BRASOV	589028	615	12	3786000	52	2988476
10	BUCURESTI	1926334	602	29	3844000	178	9773396
11	BUZAU	496214	292	3	1776000	26	2517578
12	CALARASI	324617	117	1	710000	11	1646968
13	CARAS SEVERIN	333219	175	2	1066000	35	1690611
14	CLUJ	702755	411	22	2642000	99	3565479
15	CONSTANTA	715151	394	7	2420000	67	3628371
16	COVASNA	222449	461	19	2918000	63	1128611
17	DAMBOVITA	541763	181	4	1118000	17	2748674
18	DOLJ	734231	422	2	2548000	15	3725174
19	GALATI	619556	181	3	1110000	24	3143362
20	GIURGIU	297859	375	0	2250000	12	1511209
21	GORJ	387308	288	4	1760000	18	1865035
22	HARGHITA	326222	1143	6	6906000	142	1655111
23	HUNEDOARA	485712	332	5	2032000	72	2464295
24	IALOMITA	296572	108	0	648000	33	1504680
25	IASI	816910	423	4	2570000	15	4144652
26	ILFOV	300123	135	5	850000	15	1522696
27	MARAMURES	510110	225	6	1398000	110	2588080
28	MEHEDINTI	306732	347	1	2090000	30	1556227
29	MURES	580851	508	6	3096000	62	2946990
30	NEAMT	554516	490	0	2940000	73	2813377
31	OLT	489274	482	7	2948000	11	2482367
32	PRAHOVA	829945	292	5	1792000	26	4210786
33	SALAJ	248015	348	0	2088000	28	1258322
34	SATU MARE	367281	287	11	1810000	33	1863427
35	SIBIU	421724	499	5	3034000	81	2139647
36	SUCEAVA	688435	549	12	3390000	46	3492825
37	TELEORMAN	436025	271	1	1634000	17	2212205
38	TIMIS	677926	435	31	2858000	54	3439507
39	TULCEA	256492	160	5	1000000	13	1301331
40	VALCEA	413247	390	4	2372000	23	2096639
41	VASLUI	455049	299	1	1802000	62	2308724
42	VRANCEA	387632	241	3	1470000	21	1966679
		21680974	15764	347	97360000	2030	109899996

Table 3

	Counties	Residence	Approved 6000 RON	Approved 8000 RON	The amount finally approved	The amount of funding initially allocated	a)	b)	c)
1	ALBA	382747	517	2	3118000	1941895	3.20	8.15	1.61
2	ARAD	461791	449	8	2758000	2342930	2.83	5.97	1.18
3	ARGES	652625	309	3	1878000	3311140	1.93	2.88	0.57
4	BACAU	706623	469	2	2830000	3585103	2.91	4.00	0.79
5	BIHOR	600246	817	101	5710000	3045392	5.86	9.51	1.87
6	B.NASAUD	311657	283	5	1738000	1581214	1.79	5.58	1.10
7	BOTOSANI	452834	339	0	2034000	2297486	2.09	4.49	0.89
8	BRAILA	373174	103	0	618000	1893325	0.63	1.66	0.33
9	BRASOV	589028	615	12	3786000	2988476	3.89	6.43	1.27
10	BUCURESTI	1926334	602	29	3844000	9773396	3.95	2.00	0.39
11	BUZAU	496214	292	3	1776000	2517578	1.82	3.58	0.71
12	CALARASI	324617	117	1	710000	1646968	0.73	2.19	0.43
13	CARAS SEVERIN	333219	175	2	1066000	1690611	1.09	3.20	0.63
14	CLUJ	702755	411	22	2642000	3565479	2.71	3.76	0.74
15	CONSTANTA	715151	394	7	2420000	3628371	2.49	3.38	0.67
16	COVASNA	222449	461	19	2918000	1128611	3.00	13.12	2.59
17	DAMBOVITA	541763	181	4	1118000	2748674	1.15	2.06	0.41
18	DOLJ	734231	422	2	2548000	3725174	2.62	3.47	0.68
19	GALATI	619556	181	3	1110000	3143362	1.14	1.79	0.35
20	GIURGIU	297859	375	0	2250000	1511209	2.31	7.55	1.49
21	GORJ	387308	288	4	1760000	1865035	1.81	4.54	0.94
22	HARGHITA	326222	1143	6	6906000	1655111	7.09	21.17	4.17
23	HUNEDOARA	485712	332	5	2032000	2464295	2.09	4.18	0.82
24	IALOMITA	296572	108	0	648000	1504680	0.67	2.18	0.43
25	IASI	816910	423	4	2570000	4144652	2.64	3.15	0.62
26	ILFOV	300123	135	5	850000	1522696	0.87	2.83	0.56
27	MARAMURES	510110	225	6	1398000	2588080	1.44	2.74	0.54
28	MEHEDINTI	306732	347	1	2090000	1556227	2.15	6.81	1.34
29	MURES	580851	508	6	3096000	2946990	3.18	5.33	1.05
30	NEAMT	554516	490	0	2940000	2813377	3.02	5.30	1.05
31	OLT	489274	482	7	2948000	2482367	3.03	6.03	1.19
32	PRAHOVA	829945	292	5	1792000	4210786	1.84	2.16	0.43
33	SALAJ	248015	348	0	2088000	1258322	2.14	8.42	1.66
34	SATU MARE	367281	287	11	1810000	1863427	1.86	4.93	0.97
35	SIBIU	421724	499	5	3034000	2139647	3.12	7.19	1.42
36	SUCEAVA	688435	549	12	3390000	3492825	3.48	4.92	0.97
37	TELEORMAN	436025	271	1	1634000	2212205	1.68	3.75	0.74
38	TIMIS	677926	435	31	2858000	3439507	2.94	4.22	0.83
39	TULCEA	256492	160	5	1000000	1301331	1.03	3.90	0.77
40	VALCEA	413247	390	4	2372000	2096639	2.44	5.74	1.13
41	VASLUI	455049	299	1	1802000	2308724	1.85	3.96	0.78
42	VRANCEA	387632	241	3	1470000	1966679	1.51	3.79	0.75
		21680974	15764	347	97360000	109899996	100.00	4.49	0.89

a) = percentage of the total final approved amount; b) = the average amount of funding per capita; c) = the ratio between the amount finally approved and the amount of funding initially allocated

Source: adapted from www.mmediu.ro-The Program „Casa Verde (Green Home) – Individuals”

Table 4. The situation fo the files submitted for funding under the ..Program Casa Verde(Green Home) individuals 2010''

	Counties	Residence	Approved 6000 RON	Approved 8000 RON	The amount finally approved	Rejected files	The success rate
1	ALBA	382747	517	2	3118000	73	87.67
2	ARAD	461791	449	8	2758000	42	91.58
3	ARGES	652625	309	3	1878000	105	74.82
4	BACAU	706623	469	2	2830000	33	93.45
5	BIHOR	600246	817	101	5710000	94	90.71
6	B.NASAUD	311657	283	5	1738000	64	81.82
7	BOTOSANI	452834	339	0	2034000	26	92.88
8	BRAILA	373174	103	0	618000	9	91.96
9	BRASOV	589028	615	12	3786000	52	92.34
10	BUCURESTI	1926334	602	29	3844000	178	78.00
11	BUZAU	496214	292	3	1776000	26	91.90
12	CALARASI	324617	117	1	710000	11	91.47
13	C.SEVERIN	333219	175	2	1066000	35	83.49
14	CLUJ	702755	411	22	2642000	99	81.39
15	CONSTANTA	715151	394	7	2420000	67	85.68
16	COVASNA	222449	461	19	2918000	63	88.40
17	DAMBOVITA	541763	181	4	1118000	17	91.58
18	DOLJ	734231	422	2	2548000	15	96.58
19	GALATI	619556	181	3	1110000	24	88.46
20	GIURGIU	297859	375	0	2250000	12	96.90
21	GORJ	387308	288	4	1760000	18	94.19
22	HARGHITA	326222	1143	6	6906000	142	89.00
23	HUNEDOARA	485712	332	5	2032000	72	82.40
24	IALOMITA	296572	108	0	648000	33	76.60
25	IASI	816910	423	4	2570000	15	96.61
26	ILFOV	300123	135	5	850000	15	90.32
27	MARAMURES	510110	225	6	1398000	110	67.74
28	MEHEDINTI	306732	347	1	2090000	30	92.06
29	MURES	580851	508	6	3096000	62	89.24
30	NEAMT	554516	490	0	2940000	73	87.03
31	OLT	489274	482	7	2948000	11	97.80
32	PRAHOVA	829945	292	5	1792000	26	91.95
33	SALAJ	248015	348	0	2088000	28	92.55
34	SATU MARE	367281	287	11	1810000	33	90.03
35	SIBIU	421724	499	5	3034000	81	86.15
36	SUCEAVA	688435	549	12	3390000	46	92.42
37	TELEORMAN	436025	271	1	1634000	17	94.12
38	TIMIS	677926	435	31	2858000	54	89.62
39	TULCEA	256492	160	5	1000000	13	92.70
40	VALCEA	413247	390	4	2372000	23	94.48
41	VASLUI	455049	299	1	1802000	62	82.87
42	VRANCEA	387632	241	3	1470000	21	92.08
		21680974	15764	347	97360000	2030	88.81

Source:adapted from www.mmediu.ro-The Program „Casa Verde (Green Home) – Individuals’’

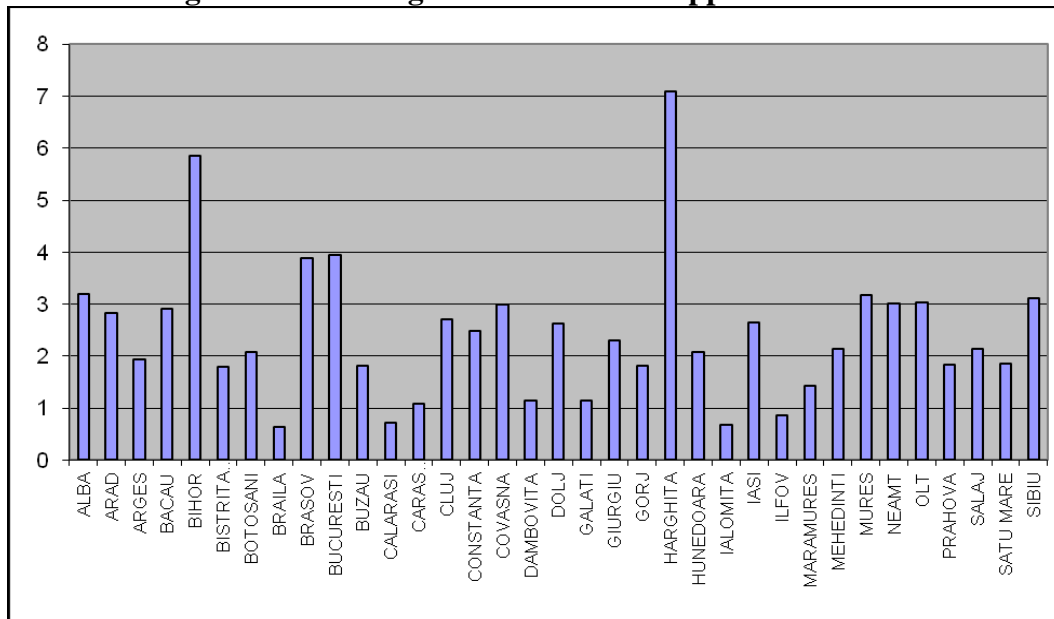
Table 5

	Counties	Residence	Approved 6000 RON	Approved 8000 RON	d)	e)	f)	g)
1	ALBA	382747	517	2	99.61	0.39	3.28	0.58
2	ARAD	461791	449	8	98.25	1.75	2.85	2.31
3	ARGES	652625	309	3	99.04	0.96	1.96	0.86
4	BACAU	706623	469	2	99.58	0.42	2.98	0.58
5	BIHOR	600246	817	101	89.00	11.00	5.18	29.11
6	BISTRITA NASAUD	311657	283	5	98.26	1.74	1.80	1.44
7	BOTOSANI	452834	339	0	100.00	0.00	2.15	0.00
8	BRAILA	373174	103	0	100.00	0.00	0.65	0.00
9	BRASOV	589028	615	12	98.09	1.91	3.90	3.46
10	BUCURESTI	1926334	602	29	95.40	4.60	3.82	8.36
11	BUZAU	496214	292	3	98.98	1.02	1.85	0.86
12	CALARASI	324617	117	1	99.15	0.85	0.74	0.29
13	CARAS SEVERIN	333219	175	2	98.87	1.13	1.11	0.58
14	CLUJ	702755	411	22	94.92	5.08	2.61	6.34
15	CONSTANTA	715151	394	7	98.25	1.75	2.50	2.02
16	COVASNA	222449	461	19	96.04	3.96	2.92	5.48
17	DAMBOVITA	541763	181	4	97.84	2.16	1.15	1.15
18	DOLJ	734231	422	2	99.53	0.47	2.68	0.58
19	GALATI	619556	181	3	98.37	1.63	1.15	0.86
20	GIURGIU	297859	375	0	100.00	0.00	2.38	0.00
21	GORJ	387308	288	4	98.63	1.37	1.83	1.15
22	HARGHITA	326222	1143	6	99.48	0.52	7.25	1.73
23	HUNEDOARA	485712	332	5	98.52	1.48	2.11	1.44
24	IALOMITA	296572	108	0	100.00	0.00	0.69	0.00
25	IASI	816910	423	4	99.06	0.94	2.68	1.15
26	ILFOV	300123	135	5	96.43	3.57	0.86	1.44
27	MARAMURES	510110	225	6	97.40	2.60	1.43	1.73
28	MEHEDINTI	306732	347	1	99.71	0.29	2.20	0.29
29	MURES	580851	508	6	98.83	1.17	3.22	1.73
30	NEAMT	554516	490	0	100.00	0.00	3.11	0.00
31	OLT	489274	482	7	98.57	1.43	3.06	2.02
32	PRAHOVA	829945	292	5	98.32	1.68	1.85	1.44
33	SALAJ	248015	348	0	100.00	0.00	2.21	0.00
34	SATU MARE	367281	287	11	96.31	3.69	1.82	3.17
35	SIBIU	421724	499	5	99.01	0.99	3.17	1.44
36	SUCEAVA	688435	549	12	97.86	2.14	3.48	3.46
37	TELEORMAN	436025	271	1	99.63	0.37	1.72	0.29
38	TIMIS	677926	435	31	93.35	6.65	2.76	8.93
39	TULCEA	256492	160	5	96.97	3.03	1.01	1.44
40	VALCEA	413247	390	4	98.98	1.02	2.47	1.15
41	VASLUI	455049	299	1	99.67	0.33	1.90	0.29
42	VRANCEA	387632	241	3	98.77	1.23	1.53	0.86
		21680974	15764	347	97.85	2.15	100.00	100.00

d) = the funding share of up to 6000 lei; e) = the funding share of up to 8000 lei; f) = the distribution per county of the approved funding files in the amount of up to 6000 lei; g) = the distribution per county of the approved funding files in the amount of up to 8000 lei

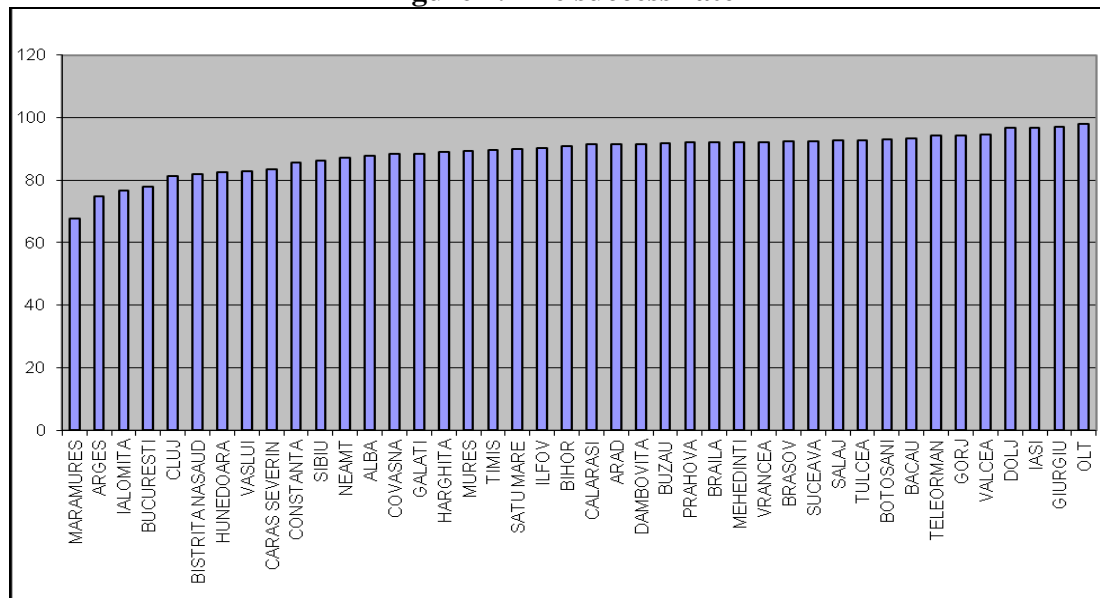
Source: adapted from www.mmediu.ro-The Program „Casa Verde (Green Home) – Individuals”

Figure 1. Percentage of the total final approved amount



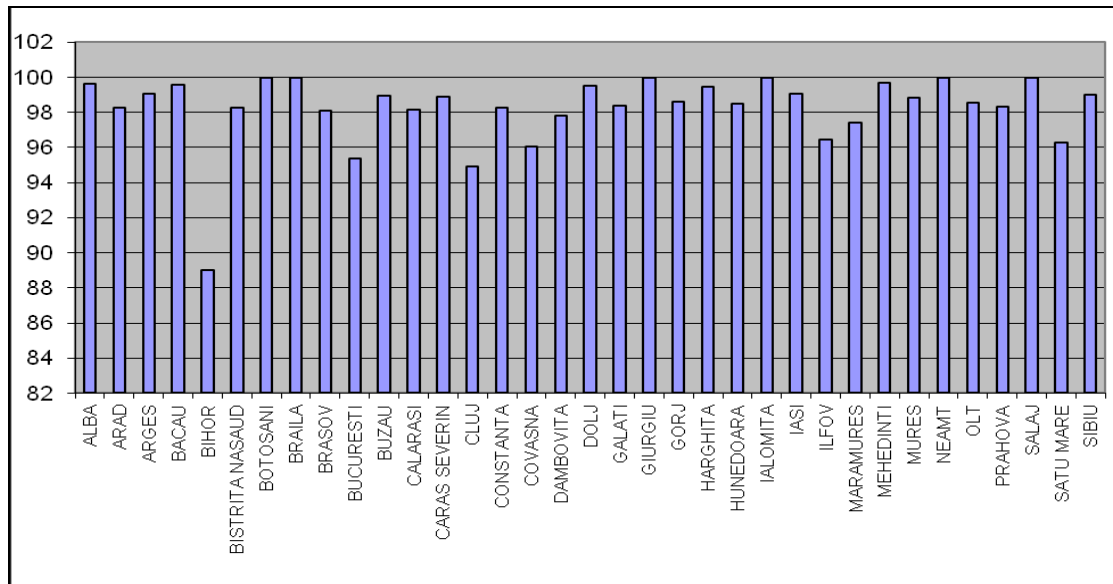
Source: adapted from www.mmediu.ro-The Program „Casa Verde (Green Home) – Individuals”

Figure 2. The success rate



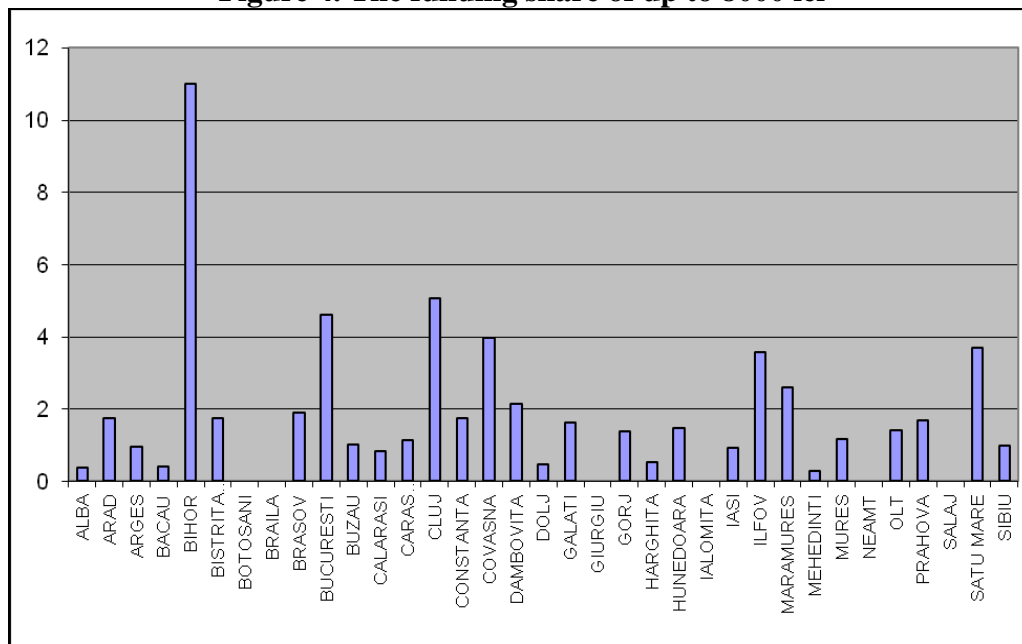
Source: adapted from www.mmediu.ro-The Program „Casa Verde (Green Home) – Individuals”

Figure 3. The funding share of up to 6000 lei



Source: adapted from www.mmediu.ro-The Program „Casa Verde (Green Home)

Figure 4. The funding share of up to 8000 lei



Source: adapted from www.mmediu.ro-The Program „Casa Verde (Green Home) – Individuals”

RESULTS

- Regarding the ratio between the amount finally approved in each county according to the submitted and approved financing files and the amount of funding initially allocated, 15 counties from the total number exceeded the fund initially allocated, and at the opening of the funding session the requests were higher than the values originally assigned. As a result, there was a redistribution of the funds between the counties and the available remaining amounts in certain counties were redistributed in these 15 counties (*see table 3*).
- In two counties, Harghita and Bihor, there was recorded a percentage of the total final approved amount by county final well above the average, reaching 7.09% and respectively 5.86% of the total allocations for the whole country (*see table 3*).

- There are four counties (Braila, Calarasi, Ialomita and Ilfov) where the share of the approved amount based on the requests is below 1% of the total allocations per country.
- The average amount of funding per capita is 21.17% for Harghita county, thus occupying the first position, well above the national average of 4.49%, followed by Covasna with 13.12%. Bihor with 9.51% and Alba, respectively Salaj with over 8%. The lowest percentage is recorded in Braila, of only 1.66% (*see table 3*).

The ratio between the amount approved at the end of the funding session and the amount initially allocated to each county reflects how county residents have successfully accessed the funding program "Casa Verde (Green Home) – individuals" given that the amounts initially allocated in each county were calculated according to the number of existing residents.

If in Harghita county the final reallocated amount was four times higher than the initial one, in counties as Braila, Galati and Bucharest a small fraction has been used. about one third of the allocated funding amount.

Regarding the success rate of the approved funding files compared to those rejected. in 11 counties (Alba, Arges, Bistrita-Nasaud, Caras Severin, Cluj, Constanta, Ialomita, Maramures, Neamt, Suceava, Vaslui) and in Bucharest Municipality this rate is below the average.

In four counties (County Giurgiu, Iasi and Olt) the rate is over 95% while in Maramures is recorded the lowest success rate of 67.74% (*see table 4*).

Overall. a high level of feasible projects complying with the program target and the Financing Guide provisions could be considered as result.

- In total 16111 applications were approved to replace conventional heating systems with renewable energy and 2030 applications were rejected.

Regarding the type of the thermal installations preferred by the applicants whose files have been approved. it is observed that the funding share of up to 6000 lei to install solar panels and biomass heating plants is above 95% in all counties. except Bihor county, with 89% (*see table 5*).

The share of the funding files amounting up to 6000 lei submitted for approval is above average for 33 counties.

The projects approved for funding the installation of heat pumps have a small share of less than 4%, except Bihor (11%). Timis (6.65%). Cluj (5.08%) and Bucharest (4.6%).

At the level of the entire population of each county two counties are well above - Harghita and Bihor, in which the distribution per county of the approved funding files in the amount of up to 6000 lei is of 7.25% and respectively 5.18% (*see table 5*).

CONCLUSIONS

In order to pass to a low carbon emissions economy and to reduce the energy dependence, Romania has lately intensified the actions promoting renewable resources. Although it disposes of an important theoretical potential, due to the technological limitations and economic efficiency, the exploitable potential of these resources is very low at present.

To promote renewable resources, the intensification of the support mechanisms to use these resources for heat and hot water is needed. in terms of financial support materialized in grants, tax rebates, and loans from banks in favourable conditions.

Aiming to improve the air, water and soil quality and to promote the proper technologies for energy production from renewable sources, a series of actions have been undertaken at regional level, including the "Program for the installation of heating systems using renewable energy, including the replacement or improvement of the conventional heating systems" which is a program for individuals also known as the Program "Casa Verde (Green Home)".

The program is carried yearly within the limit of the positions allocated by the Ministry of Environment and Forests which finances it from the Environmental Fund.

The installation of the solar panels. of the heat pumps – except the air conditioning - and of the heating plants based on pellets, briquettes, wood chips or any kind of vegetable, farming, forestry or forest products scrap and waste is funded.

In 2010, 16111 applications to replace conventional heating systems with renewable energy were approved and 24000 files were submitted in 2011, their analysis being still ongoing.

At country level there are counties which exceeded the initial allocated amount, with a higher level of demands than the originally allocated ones.

Therefore a redistribution of the funds between the counties was carried.

The conversion systems with the highest share were the solar panels and the biomass domestic thermal plants (boilers).

To achieve the national objectives regarding the climate change, up to 2020, the promotion and support of the renewable sources energy technologies is furthermore needed.

REFERENCES

Leca. A., Musatescu. V. (2008), Managementul energiei, Bucharest, Editura AGIR ;

Nicolau. I. (2008, september), Resursele de energie regenerabile in Romania, Energetica, 9, p.354-355 ;

*** www.minind.ro-Strategia energetica a Romaniei 2007-2020 ;

*** eur-lex.europa.eu- Directiva 2001/77/CE a Parlamentului European si a Consiliului ;

*** eur-lex.europa.eu- Directiva 2009/28/CE a Parlamentului European si a Consiliului ;

*** www.mmediu.ro- Programe finantate din Fondul de Mediu- „Program Casa Verde- persoane fizice”