

Innovative practices in renewable energy to Improve Rural Employability

BACĂU CASE STUDY

CONTEXT

The geographical areas included in this analysis is based on Law No.2 / 1968 on the administrative organization of the territory of Romania, republished in the Official Gazette no. 54-55 of 27 July 1981. The Constitution of 1991, republished in 2003, provides in paragraph 3, Article 3, that "territory is organized administratively into communes, towns and counties".

According to the same law, the common as, administrative unit, is "the unit comprising rural population united by common interests, traditions, consisting of one or several villages depending on their economic, social, cultural, geographical and demographic situation".

THE TERRITORIAL DELIMITATION



The N-E Development Region

Population: 3,674,367 inhabitants (16.94%)

Area: 36,850 square kilometers (15.46%)

The largest county: Suceava (8.553 km)

Bacau (6.621kmp) (The second county)

Figure 1. The N-E Development Region [ADR N-E]

THE ECONOMIC CONTEXT

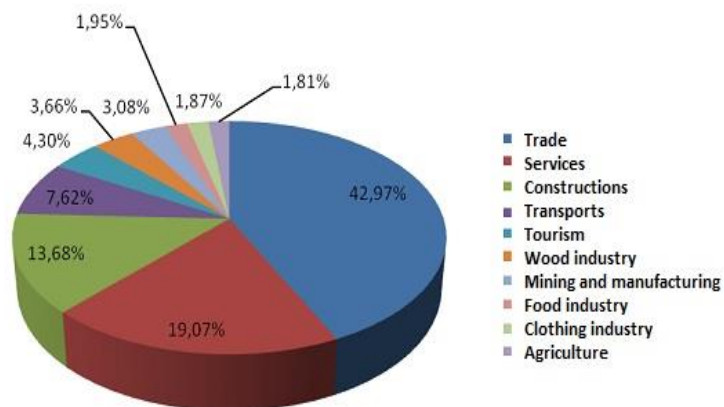


Figure 2. The share of sectors in the economy of the county, source: [Bacău County]

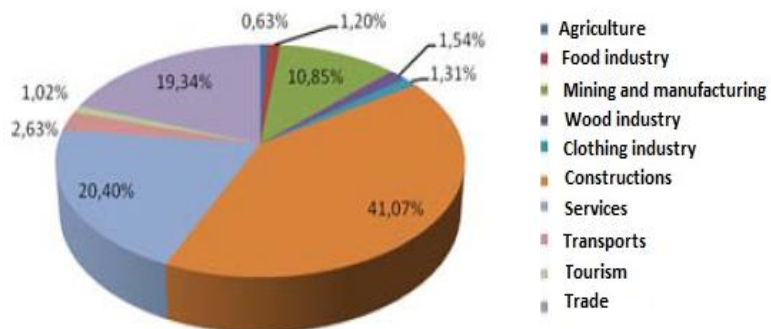
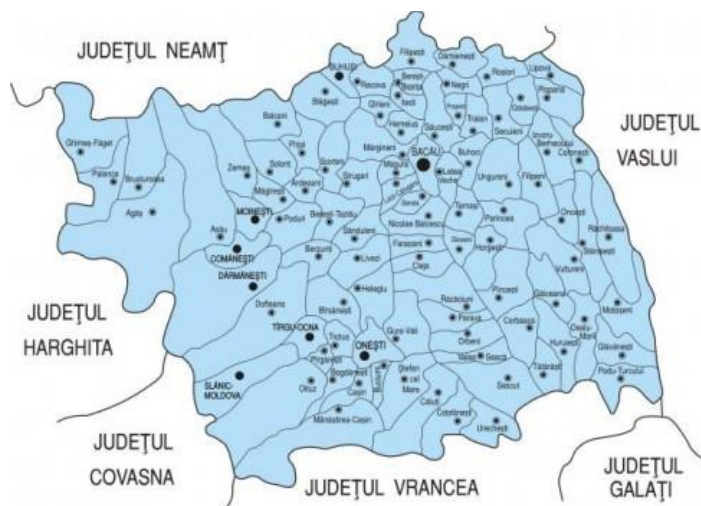


Figure 3. The share profit by industry sectors, source: [Bacău County Council]

GEOGRAPHICAL AND DEMOGRAPHIC CONTEXT



Judetul Bacau

Administrare: 8 cities and 491 villages, 85 communes.

Population: 616,000 people (2011), - 12,8 % regarding 2002.

Surface: 6.602 sq. km (2,8 % country surface)

Relief: 34% mountainous region

28% Subcarpathians East

11% Moldavian Plateau

27% Siret River Valley

42% wooded area

55% agricultural land

Figure 4. The administrative map of Bacău County, source: [Bacău County]

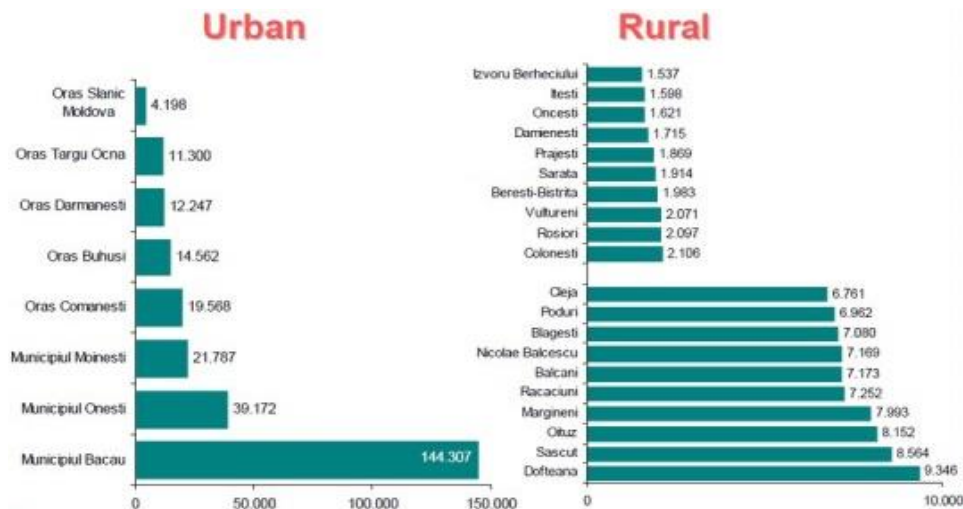


Figure 5. Urban and rural population of Bacău County, source:[NIS, Bacău County]

Bacau County

Urban population: 267.141 inhabitants (43.4%)

Rural population: 349.027 inhabitants (56.6%)

The biggest commune: Dofteana 9.346 inhabitants

The smallest common: Izvorul Berheciului 1.537 inhabitants

The average population of a common: 4.106 inhabitants

The average population of a village: 718 people

THE OF SOCIO-ECONOMIC DIAGNOSIS OF TERRITORY

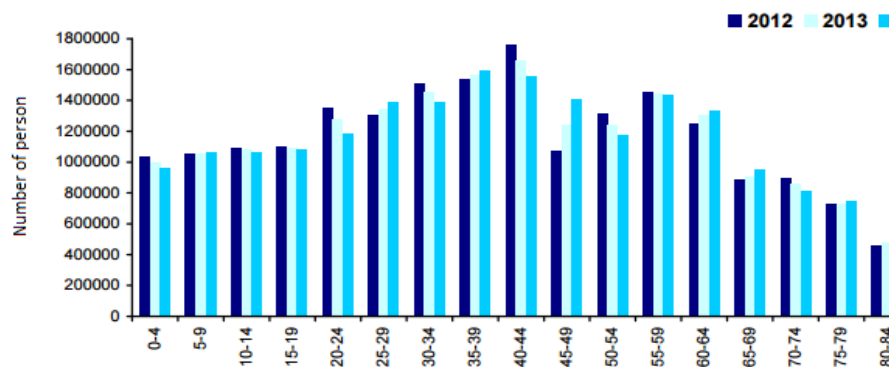


Figure 6. The stable population by age in Romania

Total	under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	
women	75473	3848	3347	3242	3479	4679	4861	5852	5297	6608	4531	6798	6817	5067	2979	3206
men	68834	3984	3716	3308	3694	4871	4910	5643	4819	5848	3828	5801	6182	4432	2408	2239

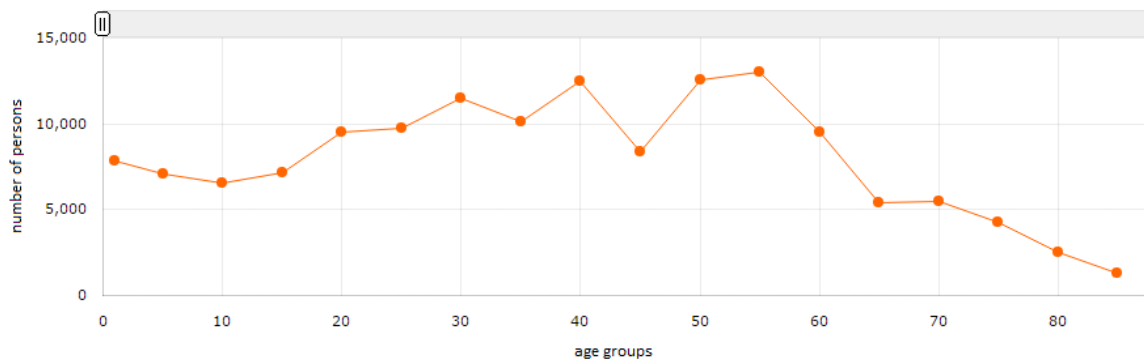


Figure 7. The stable population by sex and age group in Bacău County [NIS]

Training of the population

Table 1. School population by level of education, [NIS]

Bacau County Scholar years	Total	Preschool	Primary and secondary education				High School	Professional and apprenticeship	Post high and foremen	Higher
			Total	Primary	Secondary	Special education				
2008 / 2009	126206	23336	63716	31218	32185	313	24206	6292	1144	7512
2009 / 2010	124286	23466	62377	30413	31635	329	25914	3707	1354	7468
2010 / 2011	120063	23164	60558	29349	30830	379	26371	1513	1665	6792
2011 / 2012	114971	22386	57832	28452	29011	369	26802	276	1786	5889
2012 / 2013	112668	18696	61215	32143	28671	401	24796	880	2092	4989
2013 / 2014	109431	18038	60260	31941	27953	366	23338	1124	2089	4582

Productive structure

Table 2. Number of companies and variation before the crisis, [NIS]

	2007	2013	Variation
Romania	520032	485082	-1,072 %
N-E Region	57168	51395	-1,11 %
Bacau County	11630	10577	-1,09 %

Activitățile economice

Table 3. Contribution of the economic sectors to GDP in 2014. [Economic Analysis.]

	Romania	N-E Region	Bacau County
Agriculture	4,7 %	7.39 %	1,33%
Industry	23,39 %	21,15 %	20,27%
Constructions	8,46 %	8,66 %	12,15%
Services	50,27 %	50,47 %	49,25%
Other	13,18 %	12,06	17 %

Table 4. Percentage of workers by economic sector in 2013 (Bacău). [NIS].

	Companies %
Agriculture	3,05 %
Industry	10,77 %
Constructions	10,06 %
Services	76,13 %

Labor market

Table 5. Comparison of the rate of unemployment in Romania, N-E Region and Bacău County in the first quarters (1Q) of 2007 and 2015. Source: Own compilation based on [ANOFM] and NIS [NIS]

	2007 1Q	2015			Increasing
		Q1	Q2	Q3	
Romania	4 %	5.37 %	4.94 %	4.91 %	1.23 %
N-E Region	5.1 %	6.89 %	6.7 %	6.33 %	1,24 %
Bacau County	4.4 %	6.63 %	6,63 %	6.3 %	1,43 %

Table 6. Unemployment rate by level of education, N-E Region and Bacău County, 1st Quarter 2015. Source: Own compilation based on NIS [NIS]

	N-E Region	Bacau County
Total	78850 persson 6,89 %	13980 persson 6,63 %
Unliterate, Primary, Secondary	5,1 %	4,69 %
High School	1,3 %	1.32 %
University	0,49 %	0,62 %

RENEWABLE ENERGIES AND LOCAL DEVELOPMENT

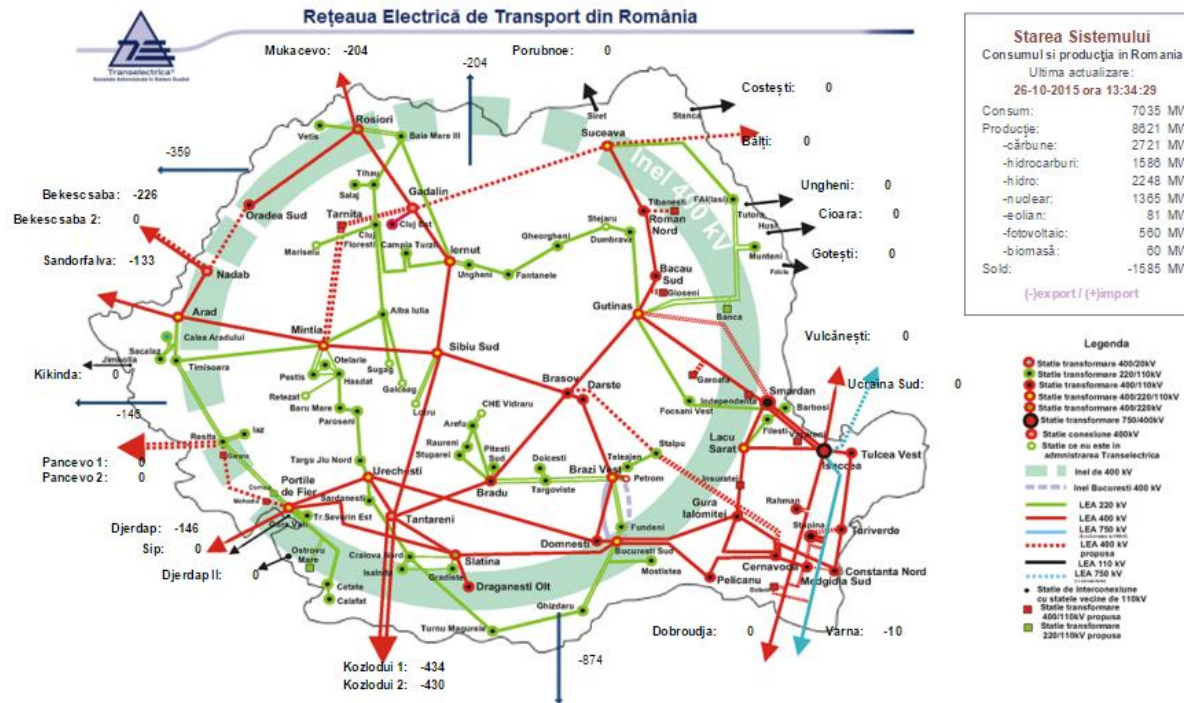
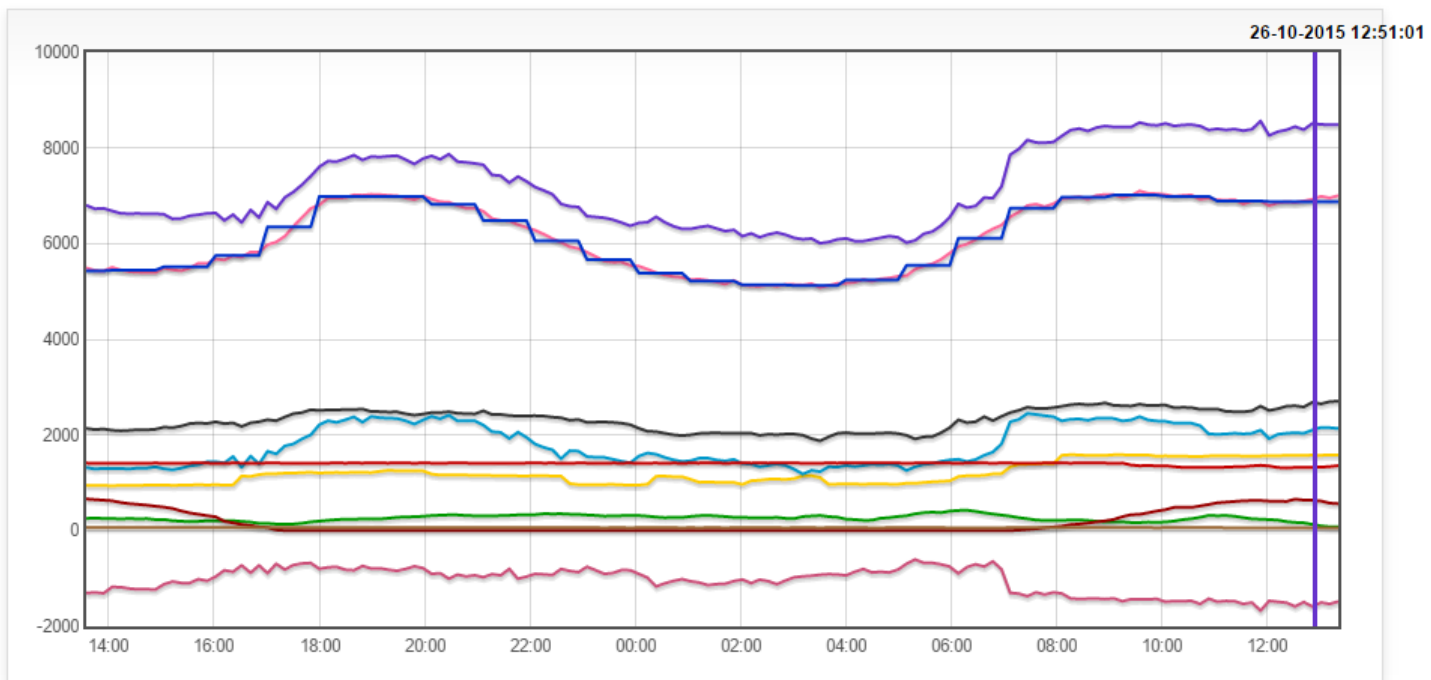
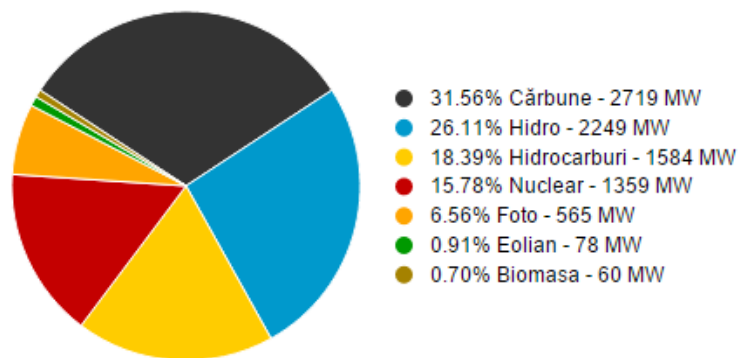


Figure 8. The Romanian electrical grid. Source: <http://www.transelectrica.ro/>

Data start: 25 ▾ octombrie ▾ 2015 ▾ 13 ▾ :30 ▾
Data stop: 26 ▾ octombrie ▾ 2015 ▾ 13 ▾ :30 ▾

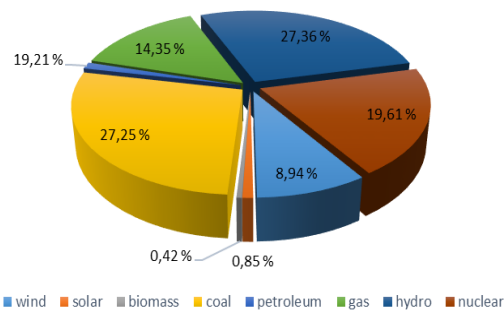
- | | | | |
|---|---|--|--|
| ■ Consum : 6925 MW | ■ Medie Orara Consum : 6877 MW | ■ Productie : 8511 MW | ■ Carbune : 2682 MW |
| ■ Hidrocarburi : 1579 MW | ■ Ape : 2102 MW | ■ Nuclear : 1323 MW | ■ Eolian : 131 MW |
| ■ Foto : 635 MW | ■ Biomasa : 60 MW | ■ Sold : -1586 MW | |





Total 8614 MW - Productia in 26-10-2015 ora 13:33:18

Romanian gross inland consumption in 3013



N-E Region gross inland consumption in 3013

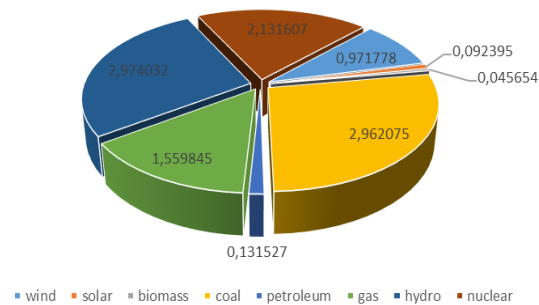
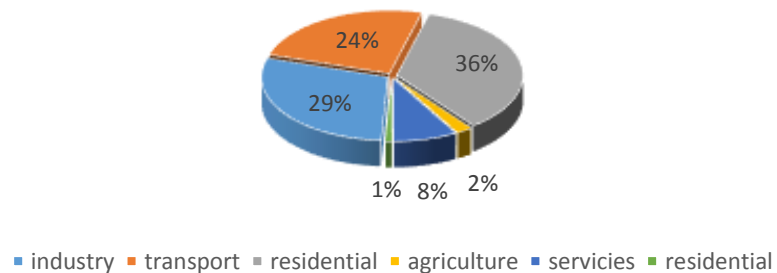


Figure 9. Real time energy production at national level (2015.10.09), in MWh, (Up) [Transelectrica], Primary energy gross inland consumption in 2013 at national level (left) and regional level (right). Source: Own compilation based on ANRE and INS, 2013. [ANRE, INS]

Roumanian final energy consumption 2013



Bacau County final energy consumption 2013

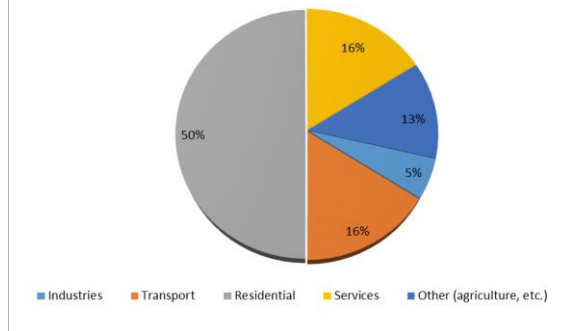


Figure 10. Final energy consumption in 2013 at national level and provincial level. Source: Own compilation based on NIS, 2013. [NIS]

DEVELOPMENT OF RENEWABLE ENERGIES

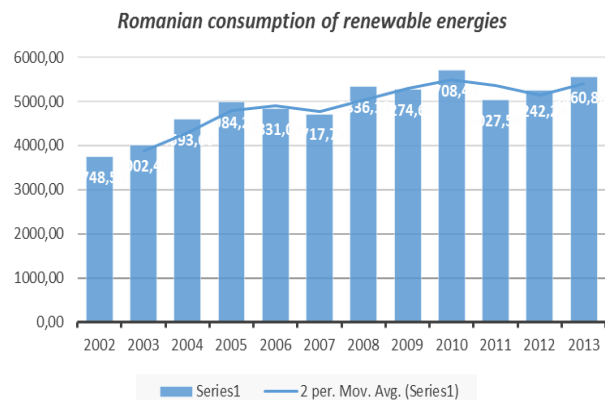


Figure 1-11. Evolution of final renewable energy share at national level

Source: Own compilation based on INS, 2013. [INS]

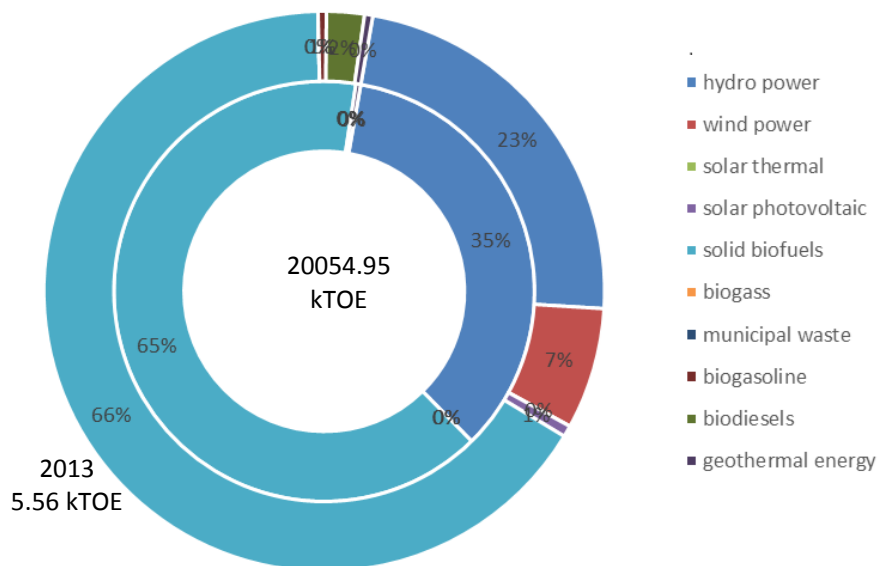


Figure 6. Evolution of national distribution of renewable energy consumption.
 Source: Own compilation based on EUROSTAT, 2013. [EUROSTAT]

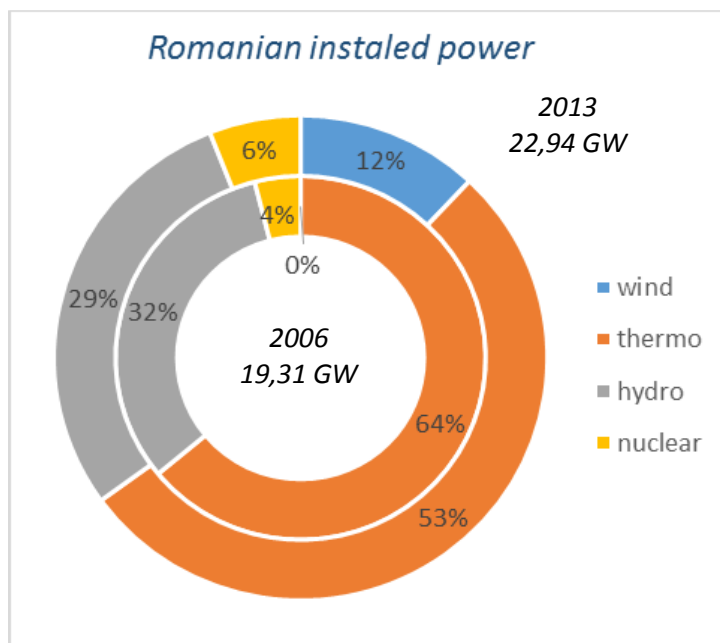


Figure 7. Installed power distribution in 2006 and 2013 at national level
Source: Own compilation based on NIS, 2013[NIS]

OBIECTIVE ȘI TRAIECTORII IN DOMENIUL ENERGIEI REGENERABILE

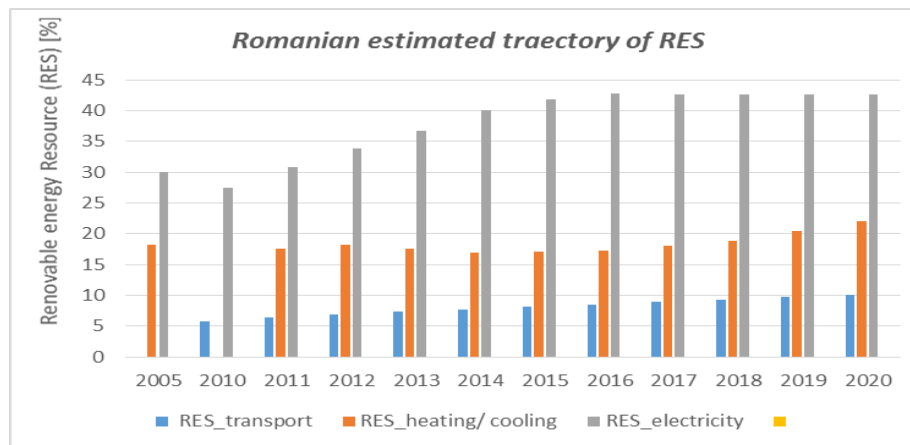


Figure 8. Romanian's 2020 target and estimated trajectory of energy from renewable sources (RES) in heating and cooling, electricity and transport as defined in 2011. Source: [Ro NREAP]

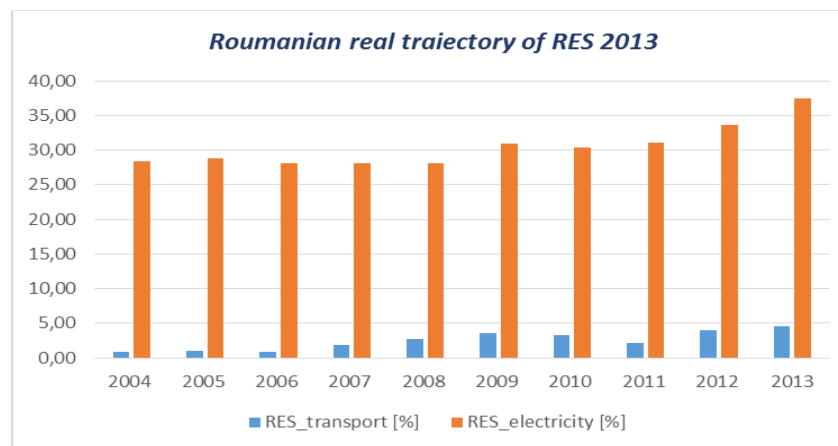


Figure 9. Romanian’s real trajectory of energy from renewable sources (RES) in electricity and transport from 2005 to 2013. Source: Own compilation based on EUROSTAT, 2013 [EUROSTAT]

The perception of local actors related to training needs in renewable energy for rural development

- General Electric
- Electrotehno
- DTV Proiect
- Electro Standard
- URBIOLED
- Bacau Chamber of Commerce and Industry
- Fruit-growing association Itești.
- „Vasile Alecsandri” University of Bacău
- „Gheorghe Asachi” University of Iași
- „N.V. Karpen” Technical College of Communications Bacău
- „Ion Ghica” Economic College Bacău
- „Ion Borcea” Technical College Buhusi
- Technological high school Dărmănești
- National Environmental Protection Agency
- Local Environmental Protection Agency

Table 7. Technical high schools Source: Own compilation based on Bacău School Inspectorate brochure

Name of high school	Profile	Qualification certificate <i>ISCED</i>
N.V. Karpen High-School	Technician for electrical installations	Level 3
	Electrician low voltage operation	Level 2
"DUMITRU MANGERON" Technical High-School, BACĂU	Technician for Electrical installations	Level 3
Grigore Antipa High-School, Bacău	Ecological and environmental quality technician	Level 3
"GHEORGHE ASACHI" Technical High-School, ONESTI	Ecological and environmental quality technician Construction and civil engineering technician Technician for electrical installations	Level 3
"A.SALIGNY" Technical High-School BACĂU	Technician in construction and public works	Level 3
"PETRU RAREȘ" Technical High School BACĂU	Mechanical Technician for maintenance and repairs	Level 3
"DIMITRIE GHIKA" Technical High-School COMANESTI	Ecological and environmental quality technician	Level 3
"GRIGORE COBALCESCU" Technical High-School MOINEȘTI	Ecological and environmental quality technician Electric technician Electronics automation technician	Level 3

"I.BORCEA" Technical High-School BUHUSI	Construction and civil engineering technician	Level 3
"LETEA" Technical High-School BACĂU	Technician in electrical installations	Level 3
"PETRU PONI" Technical High-School ONESTI	Ecological and environmental quality technician	Level 3
	Technician in electrical installations Electrician low voltage operation	Level 2
Technical High School DARMANESTI	Electronics automation technician	Level 3
"AL.VLAHUTA" Technical High School PODU TURCULUI	Technician for Construction, installation and public works	Level 3
"J. M. ELIAS" Technical High School SASCUT	Ecological and environmental quality technician	Level 3
Inclusive Education School Center No.1, BACĂU	Construction, installation and public works	Level 1/ Level 2
	Electrician relay protection, automation and power system measurements	Level 1/ Level 2

The people involved in discussions can be grouped to the following categories:

BY SEX:

- 4 women
- 13 men

BY AGE:

- 3 under 35
- 4 between 36 and 45 years
- 9 in Group 45
- 1 person has declined its age.

BY EDUCATION:

- all persons are graduates, masters or doctorate.

Table 8. Basic competences of renewable energies for rural development.

BASIC COMPETENCES		Average Score	Hierarchy
1.	Capacity for analysis and synthesis	4,25	Position 10
2.	Troubleshooting	4,75	Position 4
3.	Information management skills	4,374	Position 7
4.	Interpersonal Skills	4,187	Position 9
5.	Planning and time management	3,875	Position 13
6.	Oral and written communication	3,5	Position 14
7.	Use of ICT (Information and Communication Technologies)	4,375	Position 7
8.	Knowledge of English	4,25	Position 10
9.	Knowledge of local language	4,5	Position 6
10.	Teamwork	4,812	Position 3
11.	Networking (ability to work with different entities)	4,687	Position 5
12.	Ability to work in an international context	4,187	Position 11
13.	Ability to learn	5	Position 1
14.	Ability to apply knowledge in practice	4,812	Position 3
15.	Ability to adapt to new situations	4,937	Position 2
16.	Priority for quality	4,25	Position 8
17.	Ability to generate new ideas (creativity)	4	Position 12

Table 9. Specific competences of renewable energies for rural development

SPECIFIC COMPETENCES	Average Score	Hierarchy
1. Know the scientific-technical language and the theoretical foundation of the technologies for the application of renewable energy	4,75	Position 2
2. Ability to research and develop technologies in the field of renewable energies	4,06	Position 8
3. Be able to evaluate the advantages and disadvantages of the various primary and/or final sources of renewable energy, including hybrid systems	4,562	Position 4
4. Know how to calculate, measure and evaluate small installations for export and/or self-consumption of renewable energy	4,937	Position 1
5. Perform environmental impact studies of the various renewable energy technologies	3,75	Position 12
6. Analyze the environmental problems related to energy and relate them to global warming	3,812	Position 11
7. Analyze the role of energy as a production factor in the economic system	3,875	Position 10
8. Apply legal and tax issues affecting the renewable energy sector	4,312	Position 6
9. Understand the fundamentals of transport and distribution of electricity through the public nets of low and high voltage	3,5	Position 14
1. Know the interconnection systems between public networks and small production and / or consumption plants of electricity from renewable energy sources and current charging systems in the EU	4	Position 9
11. Identify the technical characteristics of the reception facilities of electricity in low voltage, consumer devices and its protection systems	4,312	Position 6
12. Analyse the potential for exploitation of energy crops and local processing plants for biofuels	4,125	Position 8

13. To be permanently informed about innovations in the field of bioclimatic architecture	4	Position 9
14. Know to apply the Technical Building Code as far as energy efficiency is concerned	4,375	Position 5
15. Provide ongoing information about innovations in the field of renewable energy for rural development	4,312	Position 6
16. Provide ongoing information about innovations in the field of energy efficiency and savings	4,562	Position 4
17. Know the basics of accounting and financial analysis applied to the renewable energy sector and energy efficiency and savings	3,687	Position 13
18. Promote the automation and monitoring of production processes and / or final energy consumption from renewable energies	4,25	Position 7
19. Understand and relate renewable energy to rural development from a social, economic and environmental perspective	3,812	Position 11
20. Have abilities and specific skills for installation and maintenance of small installations using renewable energy	4,687	Position 3

COLABORATORS

