

# ENERGISE

EUROPEAN NETWORK FOR RESEARCH, GOOD PRACTICE  
AND INNOVATION FOR SUSTAINABLE ENERGY 

**Project acronym:** ENERGISE  
**Title:** European Network for Research, Good Practice and Innovation for Sustainable Energy  
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## COUNTRY REPORT:

### ROMANIA

#### EXTRACTED FROM D2.5: PRODUCTION OF 30 NATIONAL SUMMARY BRIEFS

**Deliverable 2.5 description:** 30 national summary briefs of national energy supply and demand.

**Lead parties for deliverable:** AAU

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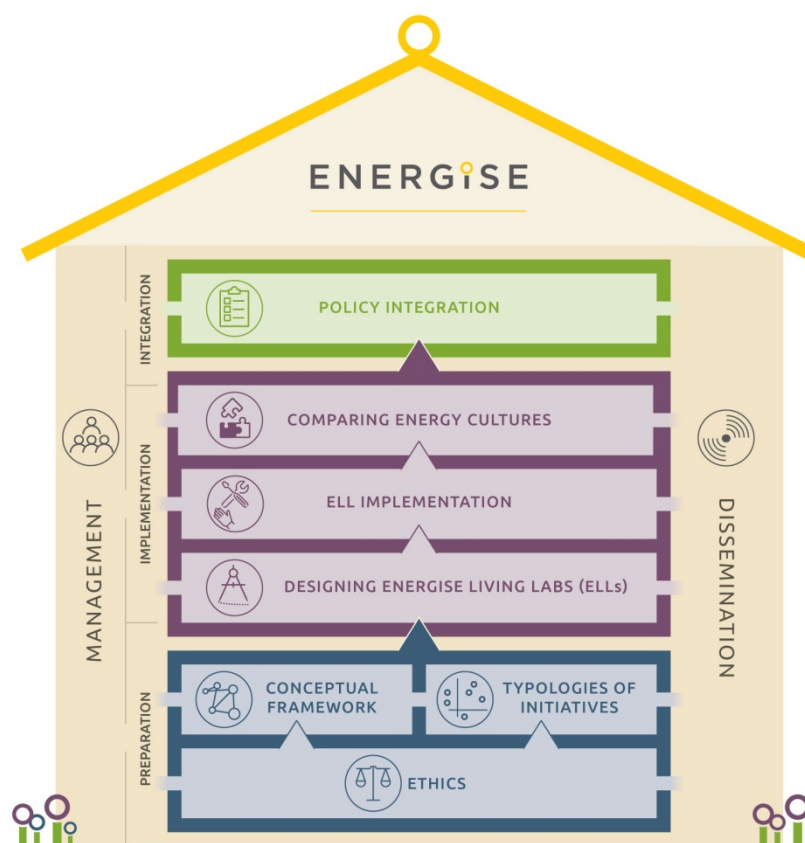
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## ENERGISE PROJECT

ENERGISE is an innovative pan-European research initiative to achieve a greater scientific understanding of the social and cultural influences on energy consumption. Funded under the EU Horizon 2020 programme for three years (2016-2019), ENERGISE develops, tests and assesses options for a bottom-up transformation of energy use in households and communities across Europe. ENERGISE's primary objectives are to:

- **Develop an innovative framework** to evaluate energy initiatives, taking into account existing social practices and cultures that affect energy consumption.
- **Assess and compare the impact** of European energy consumption reduction initiatives.
- **Advance the use of Living Lab approaches** for researching and transforming energy-related practice cultures.
- **Produce new research-led insights** into the role of household routines and changes to those routines towards more sustainable energy.
- **Encourage positive interaction** between actors from society, the policy arena and industry.
- **Effectively transfer** project outputs towards the implementation of the European Energy Union.



## INTRODUCTION

This document is one of 30 national briefs, demonstrating key aspects of national energy supply and demand dynamics. Each brief is comprised of five sections:

**Section 1** summarises the energy profile of the country. The section provides basic quantitative information of demand demographics and usage profiles, market trends and energy supply profiles, as well as qualitative reflections on current national energy policy. ***For all the briefs, the quantitative information is derived from ec.europa.eu/eurostat (2015 data), eea.europa.eu (2015 data), and climate-zone.com, unless otherwise stated.***<sup>1</sup> The qualitative reflections are based on a literature reviews and desk-research. References for the literature review and the desk-research are provided in footnotes or in section five.

**Section 2** summarises the nationally based sustainable energy consumption initiatives (SECI) that have been identified as part of ENERGISE WP2 framework (Jensen, 2017). Each SECI has been coded according to the Problem Framing Typology developed in ENERGISE WP2 (Jensen et al, 2017b).

**Section 3** provides a *good practice* example of a national SECI that corresponds to category 3: “Changes in Everyday Life” or 4: “Changes in Complex Interactions” in the Problem Framing Typology. Please refer to Jensen (2017) and Jensen et al (2017b) for more information on the way the data for the good practice SECIs has been researched and documented.

**Section 4** provides a brief summary of major nationally specific trends and their implication for energy consumption policies.

**Section 5** provides an overview of sources used for qualitative assessments, and can be used as inspiration for further reading.

The national briefs provide contextual socio-material information for the further work to be carried out in Work Package 4, Work Package 5 and Work Package 6 in ENERGISE.

### 1.1 WP2: TYPOLOGIES OF ENERGY INITIATIVES

ENERGISE WP2 is a systematic criteria-guided review and classification of existing sustainable energy consumption initiatives from 30 European countries (EU-28, Switzerland, and Norway), which provides a comprehensive European database of energy initiatives involving households, and related typologies of sustainable energy consumption initiatives. This extensive synthesizing work guides the selection of Living Lab design elements for ENERGISE and future energy consumption research, policy and practice.

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<sup>1</sup> Some piecharts will be empty, as no information is available.

This is done in order to

- Construct innovative typologies of sustainable energy consumption initiatives that can inform further research and action.
- Identify key success factors and related indicators, focusing on individual-level, collective, organizational, institutional and societal aspects of energy consumption, which will inform subsequent WP 3 (Designing Living Labs), WP 4 (ENERGISE Living Labs) and WP 5 (Capturing Energy Cultures).
- Progress the goals of the European Energy Union by creating a publicly archived open access dataset of sustainable energy initiatives across 30 countries in Europe.

Suggested further reading:

Jensen (2017) *Identification of key success factors and related indicators*. ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Grant Agreement No. 727642, Deliverable 2.2.

Jensen et al. (2017a) *Establishment of a comprehensive open access dataset of sustainable energy consumption programmes and Interventions*. ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Grant Agreement No. 727642, Deliverable 2.3.

Jensen et al. (2017b) *Constructions of typologies of sustainable energy consumption initiatives (SECI)*. ENERGISE – European Network for Research, Good Practice and Innovation for Sustainable Energy, Grant Agreement No. 727642, Deliverable 2.4.

Sources of quantitative statistics (unless otherwise stated):

Climate data:

<http://www.climate-zone.com/continent/europe/>

Demography data:

[http://ec.europa.eu/eurostat/statistics-explained/index.php/Population\\_structure\\_and\\_ageing](http://ec.europa.eu/eurostat/statistics-explained/index.php/Population_structure_and_ageing)

[http://ec.europa.eu/eurostat/statistics-explained/index.php/Educational\\_attainment\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_attainment_statistics)

Dwelling type data:

[http://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Distribution\\_of\\_population\\_by\\_dwelling\\_type\\_2015\\_\(%25\\_of\\_population\)\\_YB\\_17.png](http://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Distribution_of_population_by_dwelling_type_2015_(%25_of_population)_YB_17.png)

Energy demand and supply quantitative data:

[http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy\\_consumption\\_in\\_households](http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_consumption_in_households)

Final energy consumption of households per capita data: <https://www.eea.europa.eu/airs/2017/resource-efficiency-and-low-carbon-economy/household-energy-consumption>

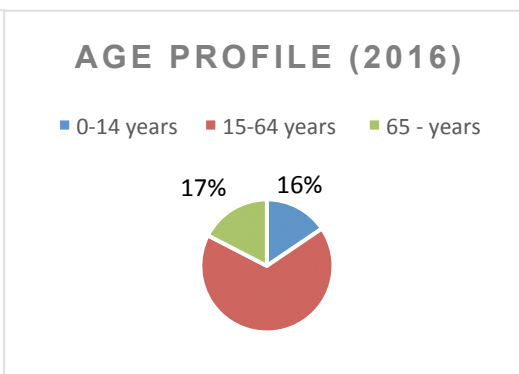
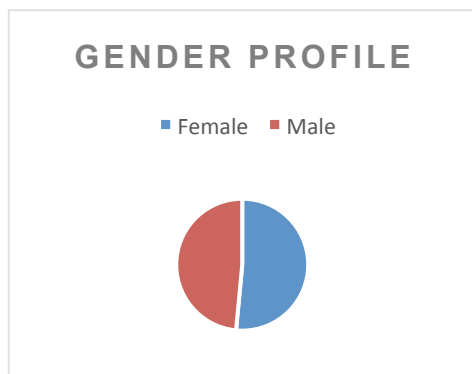
MWh conversion data:

<https://www.unitjuggler.com/convert-energy-from-toe-to-MWh.html?val=893.9>

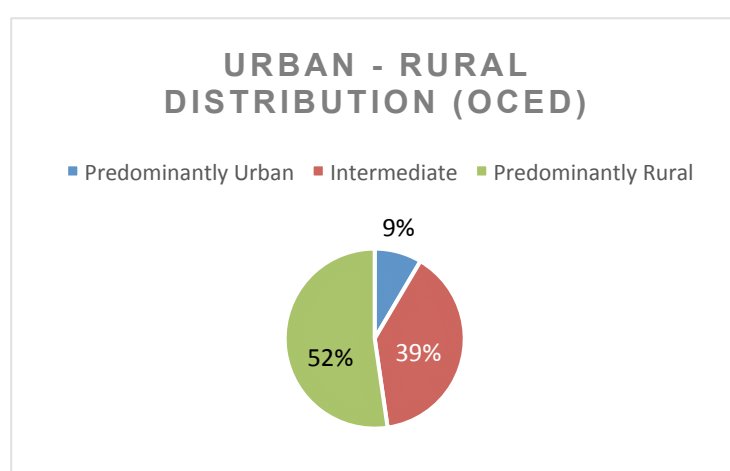
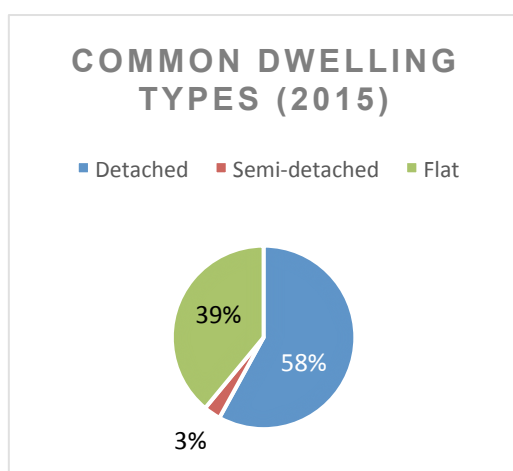
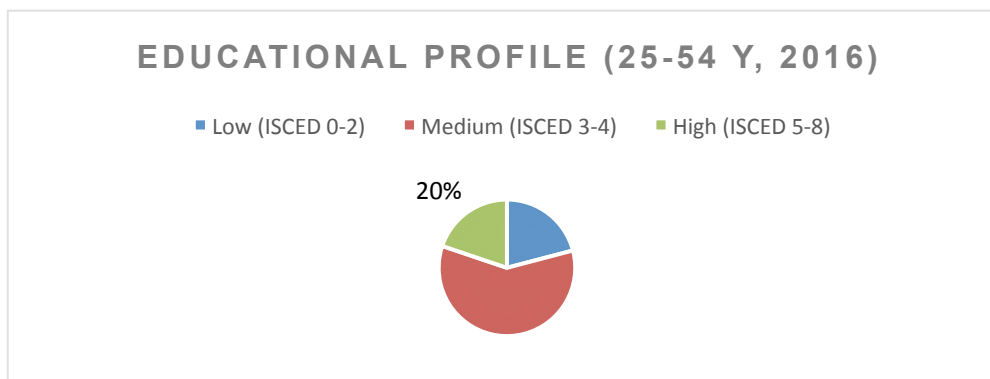
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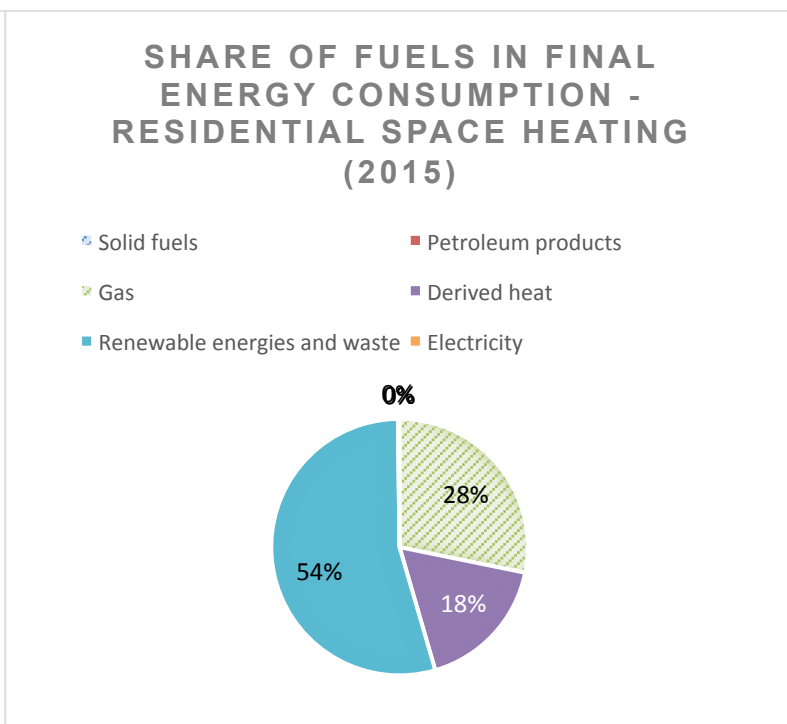
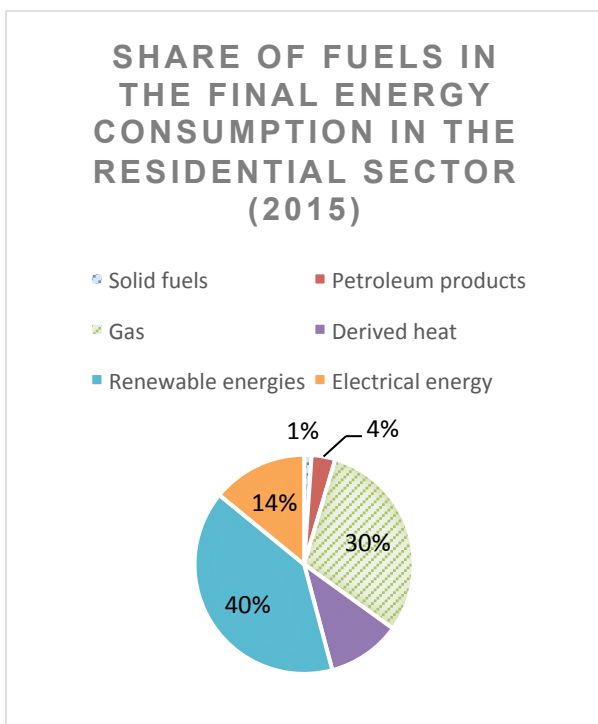
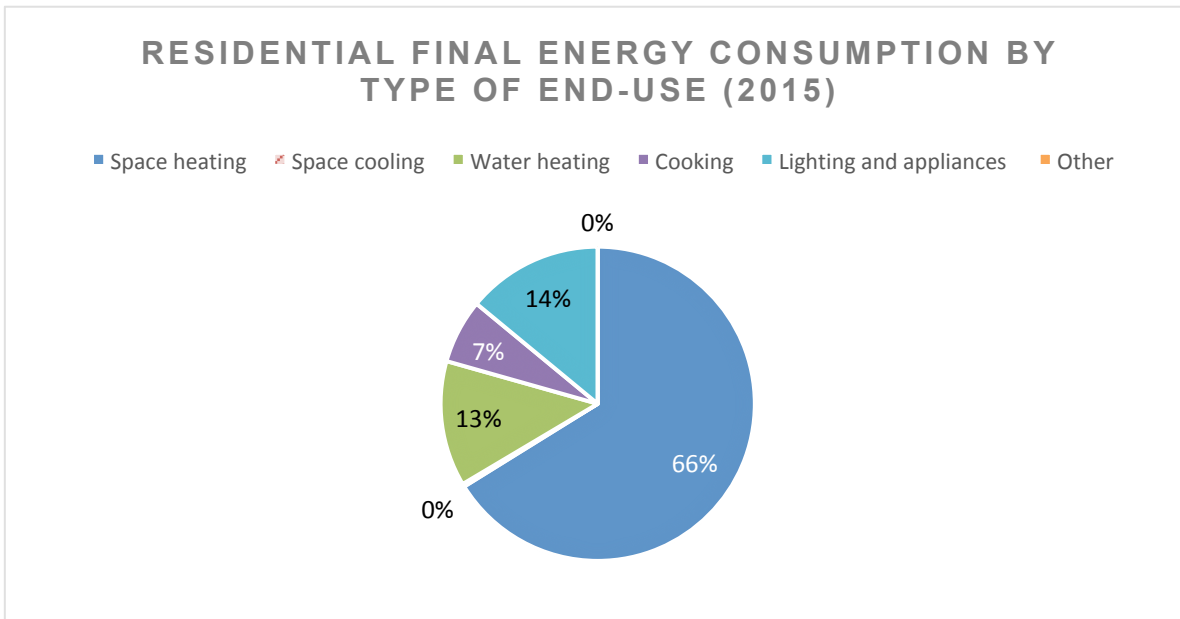
Authors: Marko Hajdinjak, Desislava Asenova

## DEMOGRAPHY, ENERGY CONSUMPTION AND ENERGY SUPPLY



**CLIMATE:**  
 temperate;  
 cold, cloudy  
 winters with  
 frequent snow  
 and fog; sunny  
 summers with  
 frequent  
 showers and  
 thunderstorms





**FINAL ENERGY CONSUMPTION FOR HOUSEHOLDS, PR CAPITA (2015)**

**4.329 MWh**



## ENERGY SYSTEM AND ENERGY POLICY TRENDS

### Energy system

Romania is one of the least dependent on energy imports European states. The country has domestic sources of natural gas, crude oil and coal. In 2013, 70% of the primary energy demand was covered by domestic production.<sup>2</sup>

In 2016, the energy production mix included nuclear power (17.1% of the total energy produced), coal power (23.4%), hydropower (29.8%), gas power (15.3%) and renewable energy (14.5%). The overall electricity generation in 2016 reached 60.7 TWh, which is approximately 1.7% lower than in 2015. Romania is a net electricity exporter.

The major three electricity generation companies in Romania are state-owned. These are Energy Complex Oltenia, Nuclearelectrica (that operates the nuclear power plant Cernavoda) and Hidroelectrica (that operated the hydropower plants). Electrical power in Romania is mainly generated from coal and hydrological resources that together contribute 58.72% to the generation of electrical power, followed by the nuclear production, which contributes 18.56%.

Two private companies are main players in the gas sector and in the field of wind energy. OMV Petrom owns the biggest gas power plant in Romania, while CEZ owns the biggest wind farms cluster.

In 2017, there were 173 licensed and registered companies for supplying electric power and 128 for natural gas; 43 out of these 258 companies are licensed for both services. Electricity supply is ensured by eight major independent Distribution System Operators (DSOs) that operate in specific regions of Romania. Five of these DSOs are private companies and members of the utility groups of companies ENEL, E.ON and CEZ, while the other three are state-owned.

Oil and gas discoveries in the Black Sea make Romania the largest producer of oil and gas in Central East Europe as well as an important player in the European oil and gas market. The main producers of natural gas in Romania are: Romgaz SA, OMV Petrom SA, Amromco Energy SRL, Raffles Energy SRL, Foraj Sonde SA, and Stratum Energy LLC. The first two companies (Romgaz SA and OMV Petrom SA) jointly cover 94.85% of aggregated consumption.

Nuclear power is also part of Romanian energy mix. The country has one nuclear power plant (NPP), Cernavoda, which has two units in operation and three more under construction. The two reactors currently in operation generate around 17% of Romania's total energy production.<sup>3</sup>

After a delay of about 10 years, electricity market in Romania was fully liberalised in the beginning of 2018, exempting household consumers from regulated tariffs that they had to pay until December 31, 2017. As of 2018, consumers will be allowed to choose between competitive regime and universal service market, with the option to return to the universal service market at any time. Romanian domestic gas market was liberalised in April 2017.<sup>4</sup>

### Particular socio-material aspects that influence energy consumption

District heating systems in most of the Romanian larger towns are supplied by heat and power co-generation plants. However, due to the poor pipeline insulation, corrosion and lack of maintenance, high energy losses in these systems are often observed, which affects heating bills for households. Another issue is the inability of the centralised heating systems to meet the peak demand. As a

<sup>2</sup> Colesca, S. E. and Ciocoiu, C. N. (2013). 'An overview of the Romanian renewable energy sector.' *Renewable and Sustainable Energy Reviews* 24, 149-158.

<sup>3</sup> Dodoiu, M. (2017). *Romania – Energy*. Available at: <https://www.export.gov/article?id=Romania-Energy>

<sup>4</sup> Balkan Green Energy News (2018). 'Romania's electricity market is now fully liberalized.' Available at: <https://balkangreenenergynews.com/romanas-electricity-market-is-now-fully-liberalised/>

consequence, consumers at the end of the district-heating network often get low quality heat and hot water. Many consumers have therefore decided to disconnect from the district heating system, replacing it with domestic solutions such as gas heating systems and wood stoves.<sup>5</sup>

According to the European Commission data, only 12.3% of Romanians in 2014 were affected by energy poverty. However, some national and international institutions consider it as a major problem in the country. Around 90% of Romanian homes in the rural area and almost 20% in cities are heated only partially. The low incomes of families make it difficult to pay the bills and many families are unable to ensure the necessary level of thermal comfort.

Electricity costs have a significant share in the energy consumption basket of households. Another problem is the fact that about 100,000 households in Romania are not connected to the electricity grid. Keeping in mind that energy poverty is defined as a condition wherein a household could not access energy services at home up to a socially and materially necessitated level, it could be concluded that energy poverty in Romania is a significant problem and special measures should be taken to address it. In this regard, one of the main goals of the Romanian Energy Strategy 2016-2030 is to reduce energy poverty and protect vulnerable customers.<sup>6</sup>

Most of the residential buildings in Romania are old and have poor thermal performance. About 80% of them need to be renovated in order to prevent heat losses through building's envelopes and thus to decrease energy consumption. After joining the EU in 2007, Romania was obliged to comply with the objectives imposed by the Directive 2009/28/EC and with the requirements of the Energy Performance of Buildings Directive by year 2020. Thermal rehabilitation of the existing building stock is among the proposed measures in order to meet the requirements, as well as applying the latest thermal performance characteristics to new buildings and establishing certificate of energy performance. However, the high costs involved in implementing all these are a barrier towards renovating the buildings.<sup>7</sup>

The price of electricity for households in Romania in the first half of 2017 was 11.98 euro cents per kWh, among the lowest in the EU.<sup>8</sup>

### Current Trends in Energy Policy

Romania is considered to be a pioneer in the field of promoting renewable energy. The availability of varied natural resources in the country has created a long tradition of using renewable energy sources for satisfying human needs – for example, since 1970s wind and water have been used in force mills, and wood and solar energy to heat water and houses.

Romania is exploiting renewable energy sources in three directions: electricity, heating/cooling and transportation. The share of energy from renewable sources in the country has increased from 16.3% in 2004 to 25% in 2016, already exceeding the target of 24% for 2020. The share in 2016 is above the EU average (17%). Despite the higher than the average levels, the energy is mainly obtained from conventional renewable sources (large hydro power plants and biomass) rather than through green renewable sources.

In order to promote the production of energy from renewable sources Romania implemented the National Renewable Energy Action Plan in 2010. The plan introduced various measures for promotion

<sup>5</sup> Colesca, S. E. and Ciocoiu, C. N. (2013). 'An overview of the Romanian renewable energy sector.'

<sup>6</sup> Clodnitchi, R. and Busu, C. (2017). *Energy Poverty in Romania – Drivers, Effects and Possible Measures to Reduce its Effects and Number of People Affected*. Available at: <https://www.degruyter.com/downloadpdf/i/picbe.2017.11.issue-1/picbe-2017-0015/picbe-2017-0015.pdf>

<sup>7</sup> Muresan, A. A. and Attia S. (2017). 'Energy efficiency in the Romanian residential building stock: A literature review.' *Renewable and Sustainable Energy Reviews*.

<sup>8</sup> Statista (2018). *Electricity Prices for Households in Romania from 2010 to 2017*. Available at: <https://www.statista.com/statistics/418113/electricity-prices-for-households-in-romania/>

of RES such as the creation of a legislative framework for renewable energy, the development of a functional system of incentives, the use of environmental funds and the development of a national strategy for renewable energy. The country also adopted a quota system with tradable green certificates that represent an additional income received by producers for the delivery of renewable energy in the grid.<sup>9</sup>

Besides the target of reaching 24% share of energy from renewables in gross final energy consumption by 2020, other energy efficiency targets of Romania are to decrease greenhouse gas emissions by 20% compared to the level in 1990, and to reduce the volume of primary energy consumption by 19% in order to ensure energy efficiency growth.<sup>10</sup>

According to EU requirements, 80% of electricity consumers in Romania should have smart meters installed by 2020. An investment of EUR 38.12m was allocated to the installation of smart meters in homes within the Large Infrastructure Operational Programme (LIOP) 2014-2020. Furthermore, CEZ Romania has already installed approximately 50,000 smart meters, targeting mainly households and small firms. The aim is to install at least 436,000 smart meters by 2020. Electrica, which is the main electricity supplier in Romania, has also invested in the installation of smart meters and their integration into the tele-management systems. The company plans to install 500,000 smart meters by the end of 2018. The Romanian National Regulatory Authority for Energy (ANRE) has given Enel (one of the energy suppliers in Romania) the permission to install 110,000 smart meters in 2016 as part of a pilot in Romania. The company plans to install similar meters for its 2.7 million clients and thus to pave the way for larger smart cities and infrastructure.<sup>11</sup>

### Trends in national campaigns

Many national campaigns are aimed at promotion of RES. A few examples of energy campaigns in Romania are: i) An information campaign for final consumers in Romania organised by the Romanian National Regulatory Authority for Energy (ANRE) aimed at promoting energy efficiency measures and at educating consumers about the use of renewable energy and its benefits to daily living and to family budget; ii) The European campaign “Say YES to wind power” which aims to inform the Romanian society about the social, environmental and economic benefits of wind energy and of other type of energy provided by renewable energy sources. In Romania, the campaign is coordinated by PATRES (The Renewable Energy Producers Organization).<sup>12</sup>

<sup>9</sup> Colesca, S. E. and Ciocoiu, C. N. (2013). ‘An overview of the Romanian renewable energy sector.’;

EUROSTAT (2018). *SHARES (Renewables)*. Available at: <http://ec.europa.eu/eurostat/web/energy/data/shares>

<sup>10</sup> Lazar, I. (2015). ‘Energy Efficiency trends and policies in Romania.’ *Romanian Energy Regulatory Authority Energy Efficiency Department*. Available at: <http://www.odvssee-mure.eu/publications/national-reports/energy-efficiency-romania.pdf>







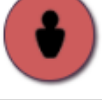
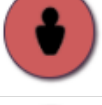
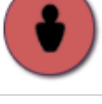
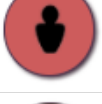


<sup>11</sup> FRD Center (n.d.). *Romanian Smart Grid and Smart Metering. Developments and potential opportunities for international collaboration*. Available at: [https://romania.trade.gov.pl/pl/f/download/fobiect\\_id:414492](https://romania.trade.gov.pl/pl/f/download/fobiect_id:414492)


<sup>12</sup> European Times (2015) ‘Leading Energy Market Reform in Romania.’ *European Times*. Available at: [www.anre.ro/download.php?f=ga6B&t=wOq0w9nTnMqmorLosA%3D%3D;](http://www.anre.ro/download.php?f=ga6B&t=wOq0w9nTnMqmorLosA%3D%3D;)

Nineoclock (10 May, 2016). ‘Romania enters the “Say YES to wind power” European campaign. The organizers prompt: “Be an energy hipster!”’ *Nineoclock News*. Available at: <http://www.nineoclock.ro/romania-enters-the-say-yes-to-wind-power-european-campaign-the-organizers-prompt-be-an-energy-hipster/>

## OVERVIEW OF NATIONAL SECIS

Below please find a list of Romanian SECIs that have been researched and documented through WP2 of ENERGISE. The SECIs are researched, selected and documented based on a set of requirements and research interests (please see Jensen 2017 for details). The list should not be regarded as exhaustive or representative of all kinds of energy initiatives carried out in the country.

iBROAD: Individual Building (Renovation) Roadmaps		Changes in Technology
SAVES2: Students Achieving Valuable Energy Savings 2		Changes in Individuals' Behaviour
START2ACT		Changes in Technology
ACCESS: Accelerated Penetration of Small-Scale Biomass and Solar Technologies		Changes in Technology
PRO.MOTION: Creating liveable neighbourhoods while lowering transport energy consumption		Changes in Individuals' Behaviour
EGS: Energy, Education, Governance and Schools. A European school panel for involving local communities in energy efficiency programs		Changes in Complex Interactions
TOPTEN ACT: Enabling consumer action towards top energy-efficient products		Changes in Individuals' Behaviour
enCOMPASS: Collaborative Recommendations and Adaptive Control for Personalised Energy Saving		Changes in Individuals' Behaviour
EYEMAN CHAMPIONSHIP: European Young Energy Manager Championship		Changes in Individuals' Behaviour
ENESCOM: European Network of Information Centres promoting Energy Sustainability and CO2 reduction among local COMMunities		Changes in Individuals' Behaviour
MOBILE2020: More biking in small and medium sized towns of Central and Eastern Europe by 2020		Changes in Everyday Life Situations
TRENDY TRAVEL: Emotions for Sustainable Transport		Changes in Everyday Life Situations

REMODECE: Residential Monitoring to Decrease Energy Use and Carbon Emissions in Europe		Changes in Individuals' Behaviour
Replacing incandescent light bulbs with energy-efficient ones		Changes in Technology
Suceava electro-mobility		Changes in Everyday Life Situations
Bistrita without car		Changes in Everyday Life Situations
ECOgroups: Involvement of school children		Changes in Everyday Life Situations
Casa Verde		Changes in Technology
Casa Verde Plus		Changes in Technology
Improving Energy Efficiency in Low-Income Households and Communities in Romania		Changes in Technology
Light for Romania		Changes in Complex Interactions
Thermal rehabilitation of blocks of flats		Changes in Technology
ANEGRO		Changes in Individuals' Behaviour
Marathon 2020 - start the long run for a green future		Changes in Individuals' Behaviour

## ‘GOOD PRACTICE’ EXAMPLE OF ROMANIAN SECI



### Light for Romania

#### Description

According to the 2011 Population and Housing Census data, over 100,000 homes in Romania have no access to electricity. An NGO “Free Miorita” is running a project for bringing electricity to remote Romanian villages disadvantaged by location and lack of infrastructure. Since 2013, the project has brought light to the homes of 78 families and to two churches in villages across Romania, which previously had to make use of oil lamps, candles or flashlights. As these homes / villages are not connected to the grid, electricity is produced by solar panels.

#### Contextualization

In some corners of the EU, there are remote areas where life goes on without facilities that most Europeans consider a given fact: electricity, running water, gas, sewage, asphalted roads and the Internet. In mountainous and other hard-to-reach areas of Romania, numerous villages live in virtual isolation. According to the latest (2011) Census, over 100,000 homes are not connected to the national electricity grid.

The initiative Light for Romania is a campaign to bring light into the households without electric power. The reasons for this situation can be different. Sometimes households do not have access to the electricity grid because they are located in very remote places that are too far from the last electrical pillars, or people may be too poor to pay for the needed permits and connection fees. The project was designed and implemented by the NGO “Free Miorita,” which tries to at least partially fill the gap left by the inactive and disinterested state. The basic idea, which triggered the entire initiative, was to make a direct impact in small communities, by challenging an embedded Romanian national mentality of “things are the way they are and nothing can be done about it.”

#### Aims and objectives

The overall aim of the NGO “Free Miorita” is to improve the rural life through lively, proactive and determined actions involving the local communities in the process. This is achieved by raising money through ambitious and innovative campaigns and using it to purchase and install solar panels for households in remote villages without access to the national electricity grid.

#### Methods for intervention

The initiative applied several methods of intervention. During the fund-raising campaign, providing information and raising public awareness was the most important element. These activities did not target the households the initiative was aiming at, but the wider public and above all corporate actors, who were expected to contribute financially and make the project possible in the first place. Citizens ready to contribute funds were invited to file a request to the Financial Administration in their place of residence, and ask that 2% of their income tax was redirected to “Free Miorita” for the Light for Romania campaign.

The amount was calculated and paid directly by National Agency for Fiscal Administration to Free Miorita's account some months after the submission of the forms.

Each year, the initiative is implemented in a different village. Typically, all households from the village (villages are small, consisting of 10-20 homes) are involved. The volunteers from "Free Miorita" install a solar panel at each home, and lay down all other necessary "infrastructure" to bring electricity into the home. Householders are explained how to take care of and maintain the solar panel and the battery. The initiative is a very original one and it is not easy to find a similar one in other EU countries.

### **Steps of implementation**

Between 2013 (when the initiative started) and 2017, the project brought electricity to 78 households. Each year, a different village or hamlet was targeted. First, a fund-raising campaign was launched. Some money was collected by selling different items (like textile shopping bags, stickers, cups, T-shirts, etc.) branded with "Free Miorita" logo, but most came from corporate donors, who had embraced the initiative and supported it with donations. Fund-raising became much easier after the first successful campaign was implemented in the village of Ursici, as it attracted considerable attention of media, bloggers and institutions. The initiative even caught the attention of some international media outlets, such as Al Jazeera. The communication and fund-raising campaign lasted a few months, and consisted of numerous media appearances, public events, and strong online presence (blogs, social media, web articles...). The collected funds were used for the purchase and installation of solar panels (photovoltaic cells). The cost per household is about 500 euros, and includes the solar panel itself, the battery, LED bulbs, cables, and switches. The work on the installation of the panels in the village of Ursici in 2013 took about 10 days. After all of the 14 households in the village received electricity, Ursici became the first Romanian village to be illuminated solely with solar panels.

### **Results/outcomes**

Between 2013 and 2017, "Free Miorita" brought light to 19 villages and hamlets – 78 households, 6 schools and 2 churches. The NGO does not forget about the villages once the solar panels have been installed, but regularly checks and maintains the photovoltaic systems they have installed, as many of the involved households are too poor to pay for the repairs, if something breaks down. In some cases, new equipment was installed to improve the technical performance of the photovoltaic systems and to provide more comfort to the household residents.

### **The role of the households**

The households in the selected villages contributed physical work and helped with the installation of the solar panels. They also hosted (provided accommodation and catering) the team of volunteers from "Free Miorita," who did most of the work on the electrification of the village.

### **Location**

Villages in remote, often mountainous and difficult to access areas of Romania.

**Was/is the initiative successful?**

The initiative was very successful and has considerably exceeded its original goal of bringing light to Ursici village. Since this initial step, it was repeated in other villages as well and continues to grow in scope and popularity.

**Textual and communicative aspects of the initiative**

As already noted, this is quite a unique initiative and it is hard to compare it with other projects. Its aim is not to reduce energy consumption in households, but to bring to vulnerable and marginalised families something that most people take for granted – access to electricity. While the power produced by a solar panel placed on the roof of the house cannot feed the larger household appliances like stove or refrigerator, it is sufficient to noticeably improve the comfort of residents (hot water, light, power to charge batteries of different devices, etc.). Householders also obtained a viable alternative to producing electricity by diesel generators, which meant that their GHG emissions have (modestly) decreased.

**The physical/technological aspects of the initiative**

The most important technological aspect of the initiative was the installation of solar panels on the roofs of the houses, which enabled the households to use electric power instead of alternatives like candles, flash lights, batteries, and diesel generators. This made their daily lives much more pleasant and increased their comfort. For instance, prior to the installation of solar panels, children had to make sure to complete their homework before darkness, devices like radios or mobile phones had to be used very carefully and sporadically, as it was difficult to recharge the batteries.

**CONCLUDING REMARKS AND POLICY IMPLICATIONS**

At 25% of energy generated from renewable sources, Romania is above the European average and seems on the right path towards more sustainable coverage of its energy needs. However, most of this energy comes from conventional renewable sources like hydropower and biofuel, and the country is still far from fully exploiting the potential of green renewables like solar and wind power. The national energy policy, as manifested by the National Renewable Energy Action Plan, is therefore dedicated to further promotion and uptake of renewable energy in the national energy mix. Several promotion campaigns organised by relevant state agencies aim to inform the population about the benefits of energy generated by renewable sources.

The country is also trying to improve its energy efficiency through modernisation of its energy network, including the introduction of smart grid. Like in many other European countries, poor thermal performance of residential buildings is an important problem and Romania is struggling to comply with the EU requirements about the energy characteristics of buildings. It is estimated that 80% of all residential buildings in the country will have to be renovated in order to decrease the thermal losses to the level accepted by EU standards.



24 SECIs reviewed in the frame of ENERGISE project reflect well these priorities of the Romanian energy policies. iBROAD, for example, explored and demonstrated the concept of renovation roadmaps as a tool outlining deep step-by-step renovation of buildings. ‘Thermal Rehabilitation of Blocks of Flats’ is a financing mechanism, covering 80% of the costs of thermal rehabilitation, while the remaining 20% are paid by the owners of the apartments. Initiative ‘Improving Energy Efficiency in Low-Income Households and Communities in Romania’ approached poorer households and communities, informing them how to implement energy efficiency measures by using locally-produced, energy efficient building materials.

Several initiatives foster the use of renewable energy sources. The ACCESS project addressed small-scale technologies that utilise biomass and solar energy for heating and hot-water supply in dwellings with individual and local heating systems, and projects Casa Verde and Casa Verde Plus provide grants to households to purchase solar thermal units and heat pumps.

Traffic contributes considerably to Romanian carbon footprint, as many cars are old and inefficient, and the quality of the fuel is not the best. Quite a few projects tackle car dependency and promote a change in mobility behaviour – PRO.MOTION, MOBILE2020, TRENDY TRAVEL, Suceava Electromobility and Bistrita without Cars.

One of the Romanian SECIs deserves a special mention and was presented in more detail in Section 3 – Light for Romania. As of 2018, there are still about 100,000 homes located mostly in underdeveloped and mountainous areas of the country, which are not connected to the electricity grid. Since 2013, the project has brought light to the homes of 78 family households, which had previously used oil lamps and candles. While this initiative probably cannot be a source of policy messages relevant in the wider European context, it does send a very important social, but also ecological message: that no matter how small, remote and disadvantaged, no European village or hamlet should be deprived of such a basic necessity as light – especially when it can be produced by solar power.

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