Research Regarding the Biomass Energy Potential of Romania

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Abstract: The paper presents a research regarding the biomass energy potential of Romania. Data is presented regarding the quantity and technical energy potential of the forest and agricultural biomass of Romania.

Keywords: energy potential, biomass, renewable energy sources

INTRODUCTION

Romania’s commitment towards renewable energy refers to the fact that until 2010, electrical energy from green resources will represent 33% of the national consumption, following that in 2015, this percent to grow at 35%, and in 2020 to reach 38%. To accomplish this desiderate Romania makes special efforts to sustain and encourage the accomplishment of these objectives. Romania is the first East European country which endorsed to the Energy Efficiency and Renewable Energy Partnership.

Fig. 1 presents the Romanian renewable energy production potential.

Fig. 1. Renewable energy production potential of Romania
MATERIAL AND METHOD

Based on the statistical data supplied by the National Wood Institution (NWI), Ministry of Agriculture, Forests and Rural Development (MAFRD) and the International Renewable Energy Institute (IREI) the following data was estimated: the forest and agricultural biomass quantity, the technical energy potential of the forest and agricultural biomass of Romania.

RESULTS AND DISCUSSIONS

In Fig. 2 is presented the forest biomass quantity situation of the Romanian regions.

![Fig. 2. The forest biomass quantity situation of the Romanian regions](image)

In Fig. 3 is presented the technical energy potential of the forest biomass of the Romanian regions.

![Fig. 3. The technical energy potential of the forest biomass of the Romanian regions](image)
In the Fig. 4 is presents the situation regarding the agricultural biomass quantity of the Romanian regions.

![Fig. 4. The agricultural biomass quantity of the Romanian regions](image)

In the Fig. 5 is presented the technical energy potential of the agricultural biomass in Romania.

![Fig. 5. The technical energy potential of the agricultural biomass of the Romanian regions](image)

By the energy potential point of view, Romania is divided in eight regions: The Danube Delta – Biosphere Reservation, Dobrogea, Moldova, Carpathians (East, South, West), The Transylvanian Plateau, Western plains, Subcarpathians and the Southern Plains.

In Fig. 6 is presented the available energy potential of the biomass, which contains the territorial distribution of the expected energy values obtained through the vegetal biomass in Romania.
In Fig. 7 is presented the distribution of the vegetal biomass, which contains the territorial distribution of the available Biomass in Romania.
Analysing Fig. 7 we can observe the geographical distribution of the vegetal biomass with available energy potential of Romania. According to this figure the most resourceful counties are: Suceava, Harghita, Neamţ and Bacau and at the other end we meet Constanta, Teleorman and Galati counties. The counties with the most agricultural resources are: Timis, Calarasi and Braila, and the poorest counties regarding agricultural resources are: Harghita, Covasna and Brasov.

Tab. 1 presents the available agricultural and forest resources of Romania, for the richest and poorest counties regarding this type of resource.

Tab. 1 offers the agricultural and forest resource quantities available in Romania, in the richest and poorest counties regarding this type of resource.

Table 1. Available agricultural and forest resources of Romania, for the richest and poorest counties regarding this type of resource

<table>
<thead>
<tr>
<th>Current no.</th>
<th>County</th>
<th>Resource type</th>
<th>Quantity [thousand m$^3$]</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Suceava</td>
<td>Forest resources</td>
<td>647</td>
<td>Richest counties in forest resources</td>
</tr>
<tr>
<td>2</td>
<td>Harghita</td>
<td></td>
<td>206,5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Neamţ</td>
<td></td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bacau</td>
<td></td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Constanta</td>
<td></td>
<td>10,4</td>
<td>Poorest counties in forest resource</td>
</tr>
<tr>
<td>6</td>
<td>Teleorman</td>
<td></td>
<td>10,4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Galati</td>
<td></td>
<td>10,4</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Timis</td>
<td>Agricultural resources</td>
<td>1432</td>
<td>Richest counties in agricultural resources</td>
</tr>
<tr>
<td>9</td>
<td>Calarasi</td>
<td></td>
<td>934</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Braila</td>
<td></td>
<td>917</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Harghita</td>
<td></td>
<td>41,004</td>
<td>Poorest counties in agricultural resources</td>
</tr>
<tr>
<td>12</td>
<td>Covasna</td>
<td></td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Brasov</td>
<td></td>
<td>89</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

For Romania, Biomass represents a very promising renewable energy resource, as regarding the potential, like the use possibilities. This kind of unpolluting energy is practically undepleatable on medium and long term, the costs being much more smaller (40% less as for conventional energy).

The richest counties in forest resource are: Suceava, Harghita, Neamţ and Bacau, and the poorest ones are: Constanta, Teleorman and Galati. The richest counties in agricultural resources are: Timis, Calarasi and Braila the poorest ones being: Harghita, Covasna and Brasov.

The biomass energy potential of Romania is up most important, representing approximately 65% of the total renewable energy resources.

REFERENCES


2. Turcu, I., (2006), Studiu privind evaluarea potentialului energetic actual al surselor regenerabile de energie in România (solar, vânt, biomasa, microhidro, geotermie), identificarea celor mai bune locatii pentru dezvoltarea investitiilor in producerea de energie electrica neconventionala, Research contract.