Small hydropower plants in Romania at the end of 2017

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November 9, 2017, Bucharest

RONDINE
RO06 Renewable Energy, SEE 2009-2014
In Romania, main actors in Hydropower are:

- **Ministry of Energy**
  energie.gov.ro

- **HIDROELECTRICA**
  www.hidroelectrica.ro

- **Ministry of Environment**
  www.mmediu.ro

- **APELE ROMANE - Romanian Waters National Administration**
  www.rowater.ro

- **ANRE - Romanian Energy Regulatory Authority**
  www.anre.ro

- **OPCOM - Romanian Power Market Operator**
  www.opcom.ro

and all SHPPs owners and investors and … some NGO’s, like

- **PATRES** and **ROSHA** – Romanian Small Hydropower Association
ROSZA – ARmHE

Romanian Small Hydropower Association

ROSZA is a Romanian non-profit legal person, registered according to the legal provisions.

ROSZA is a professional, non-government, non-political association without lucrative purpose.

Since 2008 (its founding year), ROSHA is a member of the European Small Hydropower Association – ESHA and benefited by its direct support.

ROSZA acts in the field of electricity generation in small hydropower plants and enables legal and organizational contacts with government and non-government institutions and bodies within the country and abroad.
ROSHA represents the interests of its members and – by concrete lobby actions – defends their rights.

OUR MEMBERS: 23 individual members and 28 companies

ROSHA promotes ideas, programs, actions (including the organization of events: conferences, round tables) complying with the requirements and needs of its members.

ROSHA has in view and aims the following:
Drawing up a system for the representation of the interests of its members in relation to the state relevant authorities, in view of developing and supporting the electricity generation in small hydropower plants and in relation to ESHA, as well.
Encouraging of partnerships between the association members. Cooperation with relevant institutions and bodies within the country and abroad. Supporting of research and preparing of studies concerning the hydroelectric potential of the inland rivers and the opportunity of small hydropower plants location in harmony with the environment. Organization of experts trainings, of conferences, workshops, round tables in the small hydropower field. Submission to ESHA of small hydropower data from Romania and the public presentation of Romania position, as well.

By the role it assumed, ROSHA intends to establish a permanent contact between and with its members, in terms of mutual support and achievement of the main goals in the small hydropower field.
Presentations in RENEXPO Bucharest 2009 - 2015

Co-organization of a national Conference about SHP at RENEXPO in Arad in 2009 … 2015

Co-organization of an international Conference about SHP at RENEXPO in Bucharest in 2010 … 2015

Participation at Sun-E forum

Protocols with IRE, Sun-E

Member in Renewable commission of SIER

Participation in round tables having as subject SHP:

In 2009 … 2015 organized by IRE, Hidroelectrica and ROSHA,
Presentation in RENEXPO Budapest 2007, where the idea of the association was born


Close to ESHA in 2 European projects: SHERPA and SHAPES

Participation with ESHA to European projects:
- SHPSTREAMMAP
- RESTOR Hydro
RESPONSES TO EUROPEAN DIRECTIVES


LEGAL FRAMEWORK

Legislation related to WFD, the Habitats Directive and the Birds Directive

Law 220/2008 for the establishment of the system for promoting of E-RES republished and modified
DEFINITION FOR SHP (SMALL HYDROPOWER)

In EU member states the definition of small hydropower: is the electric power produced in a hydropower plant with an installed capacity of at most 10 MW.

\[ \text{SHPP} = \text{HPP with } \Pi_i \leq 10 \text{ MW} \]

Others:
The indicated capacity is lower in Bosnia and Herzegovina, Croatia, Hungary and Poland – 5 MW, Latvia – 2 MW (another governmental instruction indicates 5 MW, but SHP plants < 2MW benefit from tariff support) and Estonia – 1 MW.
Mandatory quotas combined with tradable green certificates (GC)

- Fixed quantities established by Government Decision from 2010 up to 2020

- Market price for GC limited between:
  - minimum – 27 €/GC
  - maximum – 55 €/GC
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RES eligible to participate in the Green Certificates Trading System:

- **SHPPs new (starting with 01.01.2004)** → 3 GC / 1 MWh for 15 years
- **SHPPs refurbished (put into operation since at least 15 years and replacement of existent technologies with modern ones for growing the efficiency of production of energy)** → 2 GC / 1 MWh for 10 years
- **SHPPs other than the cases above** → 0.5 GC / 1 MWh for 3 years
- **Wind** → 2 GC / 1 MWh to 2017 - 1 GC / 1 MWh starting with 2018
- **Biomass, biogas, biofuels, geothermal** → 3 GC / 1 MWh
- **Solar** → 6 GC / 1 MWh
- **NO specifications for:**
  - waves, tidal energy, tidal impoundments, Ocean stream
An EGO and a GD in 2013 hit the RES sector

EGO 57-04.06.2013
For the period 01.07.2013-31.03.2017 a number of GC is postponed:
- for SHPPs new (starting with 01.01.2004) → 1 GC
- for Wind → 1 GC
- for Solar → 2 GC

GD 994-11.12.2013
Starting with 1.01.2014 the number of GC is reduced with:
- for SHPPs new (starting with 01.01.2004) → 0.7 GC
- for Wind → 0.5 until 2017 and 0.25 GC starting with 2018
- for Solar → 3 GC
RES eligible to participate in the Green Certificates Trading System:

- **SHPPs new** (starting with 01.01.2004) → 2.3 GC / 1 MWh for 15 years
- **SHPPs refurbished** (put into operation since at least 15 years and replacement of existent technologies with modern ones for growing the efficiency of production of energy) → 2 GC / 1 MWh for 10 years
- **SHPPs other than the cases above** → 0.5 GC / 1 MWh for 3 years
- **Wind** → 1.5 GC/1 MWh to 2017 – 0.75 GC / 1 MWh starting with 2018
- **Biomass, biogas, biofuels, geothermal** → 3 GC / 1 MWh
- **Solar** → 3 GC / 1 MWh
- Alternatively, feed-in tariff system for projects with the installed capacity ≤ 500 kW, methodology to be finalized/approved by ...
- **NO specifications for:** waves, tidal energy, tidal impoundments, Ocean stream

Small hydropower plants in Romania at the end of 2017
Expected income for promoted green electricity in SHPPs

**GREEN ELECTRICITY**

Option to be sold:
- By bilateral contracts at negotiated prices
- On Day Ahead Market
- To distribution companies at regulated price

Regulated price is $\sim 36.6 \, \text{€/MWh}$

**GREEN CERTIFICATES**

Option to be sold:
- by bilateral contracts
- on the centralized GC market

(3 until end 2013) 2.3, 2, or $\frac{1}{2}$ GC for 1 MWh

**GCs prices:**
- 2008-2014: $27 \ldots 55 \, \text{€/GC}$
- 2015-2030: min $> 27 \, \text{€/GC}$

$\Rightarrow$ Total revenue: $50.1 \ldots (201.6) 163.1 \, \text{€/MWh}$
inventory on 24,700 km of rivers (including 1,245 km the Danube river): 8,000 MW → 70,000 GWh/year, calculated on a basis of 30 years’ data for river flows.

<table>
<thead>
<tr>
<th>Specific power (kW/km)</th>
<th>Length of inventory rivers</th>
<th>Theoretical gross linear potential</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (km)</td>
<td>Percent (%)</td>
</tr>
<tr>
<td>&lt; 200</td>
<td>14,560</td>
<td>62</td>
</tr>
<tr>
<td>200…500</td>
<td>5,460</td>
<td>23</td>
</tr>
<tr>
<td>500…1000</td>
<td>2,440</td>
<td>11</td>
</tr>
<tr>
<td>&gt; 1000</td>
<td>990</td>
<td>4</td>
</tr>
<tr>
<td>Total (rounded)</td>
<td>23,450</td>
<td>100</td>
</tr>
</tbody>
</table>
- 34 TWh/year, from which
  - 23.3 TWh/year (68.5%) on the interior rivers, and
  - 10.7 TWh/year on the Danube river.

According with the EU: 

\[ \text{SHPP} = \text{HPP with } P_i \leq 10 \, \text{MW} \]

Technically feasible potential of SHPPs is estimated at about:

1,134 MW respectively 4,078 GWh/year
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**National Power System**

Total installed capacity in NPS in 2013 and at 1st October 2014 and Capacity in operation in specified days in November, in MW

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<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>6615</td>
<td>2731</td>
<td>6615</td>
<td>2611</td>
</tr>
<tr>
<td>Hydrocarbures</td>
<td>5464</td>
<td>1442</td>
<td>5464</td>
<td>1260</td>
</tr>
<tr>
<td>Hydropower</td>
<td>6648</td>
<td>1789</td>
<td>6681</td>
<td>2353</td>
</tr>
<tr>
<td>Nuclear</td>
<td>1413</td>
<td>1415</td>
<td>1413</td>
<td>1413</td>
</tr>
<tr>
<td>Wind</td>
<td>2605</td>
<td>459</td>
<td>2806</td>
<td>328</td>
</tr>
<tr>
<td>Biomass</td>
<td>96</td>
<td>33</td>
<td>102</td>
<td>63</td>
</tr>
<tr>
<td>Photovoltaic</td>
<td>862</td>
<td>26</td>
<td>1246</td>
<td>18</td>
</tr>
<tr>
<td>Pi [MW]</td>
<td>23703</td>
<td>7895</td>
<td>24327</td>
<td>8046</td>
</tr>
</tbody>
</table>
Small hydropower plants in Romania at the end of 2017

Installed capacity in RES, in MW; end 2012, end 2013, Feb. 2015

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>Feb. 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHP</td>
<td>427</td>
<td>531</td>
<td>578</td>
</tr>
<tr>
<td>Wind</td>
<td>1822</td>
<td>2593</td>
<td>2982</td>
</tr>
<tr>
<td>PV</td>
<td>1158</td>
<td>1274</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2298</td>
<td>4282</td>
<td>4834</td>
</tr>
</tbody>
</table>
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SMALL HYDROPOWER: Evolution for the installed capacity (Pi) and the No of plants

SHPPs Pi [MW] and No

Year

Most important problems until end 2013

Water price for hydropower is 1.1 RON (~ 0.25 Euro)/1000 m³

Monthly rent for the surface occupied with constructions in the minor riverbed is 5 Euro/month and sqm

Unstable legislation

News 2014

Untill 15 March: superposition of 2 GD: postponed of 1 GC and reduction with 0.7 GC for 1 MWh produced in new SHPPs, from 3 to 2.3 GC/MWh !!! = 1.3 GC/MWh instead of 2.3 GC/MWh

Annual tax for special constructions: 1.5% from the value of SHPP objects, reduced to 1%

Impossibility for E-RES producers to sell their GCs

News 2015 -> obligation to install measurement system for the environmental flow

News 2017 -> environmental flow: from value of flow corresponding to 10% probability of exceedance on FDC to more values depending on season
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RES-E implementation for EU member states

Source: EC 2014, TU Wien (Green-X) projections Renewable energy progress Report- 16.06.2015
Hydropower potential concession by public auction by the state, the owner, of river sectors.

In any case, the evaluation of the hydropower potential for a river sector must be made / supervised by the state not by private investors, site by site.

The limit of 10 MW for SHP must be a recommendation → lost hydropower potential by choosing a lower installed capacity then the possible one.

A development scheme must be judged about its social and environmental effects when applying the support schemes.
PRESENT SITUATION

- The market for GC is nonfunctional
- The present support scheme with GC ended at 31.12.2016
- Romania achieved the targets for 2020

What to do?
Analyses of legislation framework which implies on SHPPs and issuing of correction guidelines: corroboration between orders, regulations and laws of ANAR, Ministry of Environment and Ministry of Energy in order that the sector becomes functional and logical. Examples of good practice from Norway.

Trainings for transfer of know how and good practice from Norway.

Refurbishment / rehabilitation. Grants for SHP owners for equipments in order to comply to the new environmental requirements (fish passes, intelligent metering systems, thrash racks).

Grants for SHPPs owners for the demolition, decommissioning and site renaturation for scrapped, destroyed or SHPPs whose existence is no longer justified (Ministry of Environment EEA Grants operator).

Romania has SHPPs infringement chapter because there are SHPPs built in protected areas. Examples of good practice in Norway on SHPPs in protected areas.
Renewable Energy House!
*Bruxelles.*
*Photo: Bogdan Popa*

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133 years of hydropower in Romania!
*We still have a lot of work to do!*

*Thank you!*

SHPP Peleș (1884), the oldest SHPP in Romania
*Photo: Bogdan Popa*