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Recommended citation:
4 Europe
4.1 Eastern Europe

4.1.6 Poland
European Small Hydropower Association, Stream Map

<table>
<thead>
<tr>
<th>Key facts</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Population</td>
<td>38,415,284</td>
</tr>
<tr>
<td>Area</td>
<td>312,685 km²</td>
</tr>
<tr>
<td>Climate</td>
<td>Temperate with cold, cloudy, moderately severe winters with frequent precipitation; mild summers with frequent showers and thundershowers¹</td>
</tr>
<tr>
<td>Topography</td>
<td>Mostly flat plain; mountains along southern border</td>
</tr>
<tr>
<td>Rain pattern</td>
<td>Average annual rainfall is 583 mm, in most regions of the country it ranges between 500 mm and 600 mm. In smaller areas in the uplands and the mountains along Poland's southern border annual rainfall may reach as much as 800 mm to 1,500 mm; central Poland receives 450 mm to 550 mm, the coastal zone 500 mm to 600 mm. Two-thirds of annual rainfall occurs in the summer. Snow accounts for two thirds of winter (December to March) precipitation.²</td>
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Electricity sector overview
The Ministry of Economy is in charge of the power and energy sectors in Poland. The total energy generation of Poland in 2011 was 163,153 GWh from 37,327 MW capacity plants, with the majority derived from fossil fuel energy (figure 1). In 2009, the installed capacity of hydropower was a small part of the whole at 932 MW.³

![Figure 1 Electricity generation in Poland](Source: Urząd Regulacji Energetyki⁴)

The Polish National Energy Conservation Agency (KAPE) supports the national sustainable energy policy expressed, for example, in the Constitution of Poland (the part concerning sustainable development); the Energy Law; Principles of Energy Policy by 2020; ²nd National Ecological Policy; Policy of Sustainable Development of Poland; and Development Strategy on Renewable Energy Sector.

Small hydropower sector overview and potential
In 2010 Poland had 722 small hydropower plants and a total installed capacity of 275 MW (generating 1,036 GWh per year). By 2020, the aim is to have 840 plants with a total installed capacity of 332 MW, generating 1,130 GWh (figure 2), while the total economic small hydropower potential with environmental constraints is 1,928 GWh.⁵

![Figure 2 Small hydropower capacities in Poland](Source: Stream Map⁵)

Note: Potential is based on planned capacity by 2020.

In the past two decades the average annual rise in small hydropower installed capacity was 6 MW. However, much slower growth has been observed since 2005. According to the information by the European Small Hydropower Association, plants with a total capacity of 30 MW are currently under construction or in the phase of advanced construction preparations. Unfortunately, some of them have remained in this state since the 1990s.⁶

It is worth noting that at the end of 2009 there were nine installations with valid electricity production concessions (with total capacity of 5 MW); while seven such concessions issued in 2010. In the coming years, small hydro development in the country will probably see better access to the dams owned by the State and development of technology enabling rational utilization of dams with head below 2 metres. At the beginning of the 1990s, the total hydropower potential was about 200 MW. Since then, small hydropower power plants with total capacity of 120 MW have been put in operation. Only a small fraction has been erected together with new dams. In general, erection of new dams proceeds slowly and encounters numerous obstacles.

In Poland, one of the benefits of small hydropower in developing electric power grid and especially in maintaining the country’s electricity parameters in the surrounding areas is somehow rewarded through the reductions of grid connection charges. However, small hydropower plants in Poland are usually treated in the
same way as other renewable energy plants with capacities up to 5 MW.

**Renewable energy policy**

According to Poland’s National Renewable Energy Action Plan (NREAP), the renewable energy target by 2020 is 15.5 per cent.\(^6\) The Energy Policy of Poland until 2030 calls for increased generation of electricity from both renewable and co-generation sources, the production mix will gradually diversify, with an increased share of renewable energy (particularly wind and biomass) and the construction of a first-ever nuclear power plant in Poland.\(^7\)

**Legislation on small hydropower**

Current Polish law provides the following small hydropower related definition for residual flow (RF): ‘residual flow is the minimum flow necessary to support biological life in a watercourse’. In practice, the determined residue flow is decided by a methodology set out by the Polish Institute of Meteorology and Water Management (IMGW). The IMGW has published renewable energy values for some Polish watercourses and these data are generally accepted by the water management authorities when assessing the drafts of water use concepts.\(^5\)

A tradable green certificate system exists (6.4 euro cents/kWh on top of 5 euro cents/kWh for ‘black’ energy). The black energy price is announced annually by the Energy Regulatory Office (URE) based on the free market price from the previous year. URE also annually announces the replacement fee to be paid by energy enterprises having failed to cancel a sufficient number of certificates.

For renewable energy plants with capacity up to 5 MW, 50 per cent of realistic connection costs are covered and no concession charge is imposed on owners with capacity up to 5 MW. Grid impact assessment is required in case of renewable energy plants with capacity over 2 MW connected to the grid with rated voltage exceeding 1 kV.

**Barriers to small hydropower development**

The discussion on the future of small hydropower in Poland is occasionally affected by the opposition to any development of civil engineering infrastructure of Polish rivers. In 2009, such a discussion resulted in a memorandum demanding a moratorium on the erection of small hydropower plants in Poland; however, while the memorandum was supported by a number of institutions and media, no ban on small hydropower was implemented.\(^5\)

In the past, it was discussed that large heat power plants co-firing biomass with traditional fossil fuels have appeared to be the main beneficiary of the current green certificate system. Changes in the support mechanisms are proposed in the draft of the Renewable Energy Sources Promotion Act, currently under preparation by the Ministry of Economy. New regulations may appear highly unfavourable for large hydro, but are not expected to harm the small hydropower sector.

Only moderate development of the small hydropower sector may be expected if no far going changes in state policy are introduced. New low-head technologies will barely be compensated for deficit in economically attractive sites.\(^5\)

The key recommendations for policymakers in order to overcome the barriers identified include:\(^5\)

- Development of a national programme of harnessing the hydropower potential.
- Continuation of the process of giving access to the state owned dams to the hydropower investors and starting erection of new multitask installations within the framework of partnership between water management authorities and hydropower investors.
- Introducing regulation redirecting the incomes resulting from green certificates in state-owned hydropower plants to support investments within the sector.

**Note**

i. Census as of 31 March 2011.

**References**

