



Idroelettrica  
Lombarda Srl

# Our run-of-river power plants



# Idroelettrica Lombarda

**Our mission statement: to produce energy  
using the natural power of water**

Idroelettrica Lombarda was founded by BKW Italia in 2006 for the sole purpose of producing hydroelectric energy. BKW is one of the biggest companies in Switzerland in the energy sector and forms part of the European electricity network.



Weir on the river Oglio at Esine in the province of Brescia

## **Our plants: production for annual homes equivalent of 35,000 families**

Headquartered in Milan, Idroelettrica Lombarda currently employs 14 people at its facility in Pisogne (Brescia). This site operates a system of 8 hydroelectric plants located in various municipalities in the Italian provinces of Bergamo and Brescia, delivering a total installed capacity of 42 MW. The Paraviso power plant is an outstanding reference. Divided into two groups each with an output of 17 MW, the plant is driven by water from the river Oglio which is collected in the reservoir at Esine (Brescia). This potential energy is supplied to the plant through a 15 km long channel which is uncovered for part of its length and which terminates in a level drop of 56 metres.

The Govine plant is situated on the Brescia shore of Lake Iseo, the only facility equipped with a Pelton turbine capable of exploiting a water head of approx. 200 metres.

The other 6 hydroelectric plants are all located in Bergamo province. The water driving them, the headrace, is taken from the Borlezza ditch. After use, the water then flows into Lake Iseo. Total annual energy production is around 100 GWh, representing an annual homes equivalent of 35,000 families.

Most of this volume of electricity is delivered to the BKW Group as part of its portfolio before being sold on to end customers by Electra Italia, a group subsidiary specialising in electricity sales to industrial customers on the open market.

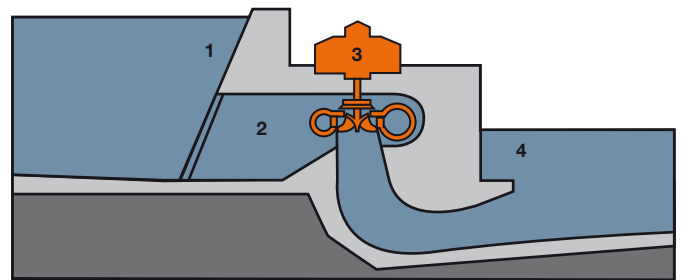
## The power of water, an inexhaustible source of energy

When allied to human ingenuity, the forces of nature can be harnessed to produce electricity – with hydroelectric plants making use of the head of water present in the regions' waterways. Each facility comprises a weir, turbines, generators and a substation. Water flows through the turbine creating a rotational movement. The generator connected to the turbine then transforms this mechanical energy into electricity.

### Run-of-river power plants

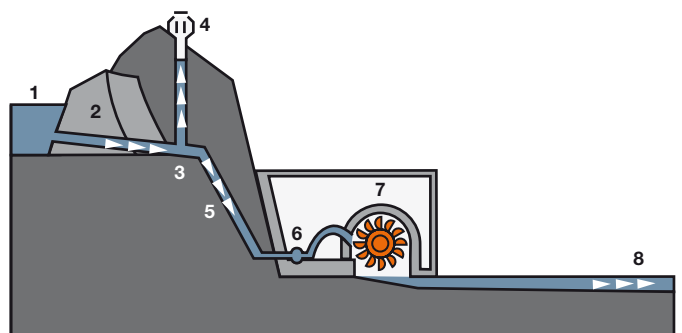
Run-of-river power plants make use of large masses of river water to exploit the difference in level between upstream and downstream water masses (head of water). This type of power plant is in continuous operation. The energy produced is used to meet the power plants' own internal requirements as well as to supply the needs of consumers through connection to the national grid. The effective output a river is capable of producing determines the volume of energy produced.

Diagram of Francis turbine



1. Upstream water
2. Water intake structure
3. Turbine with generator
4. Downstream water

Diagram of Pelton turbine

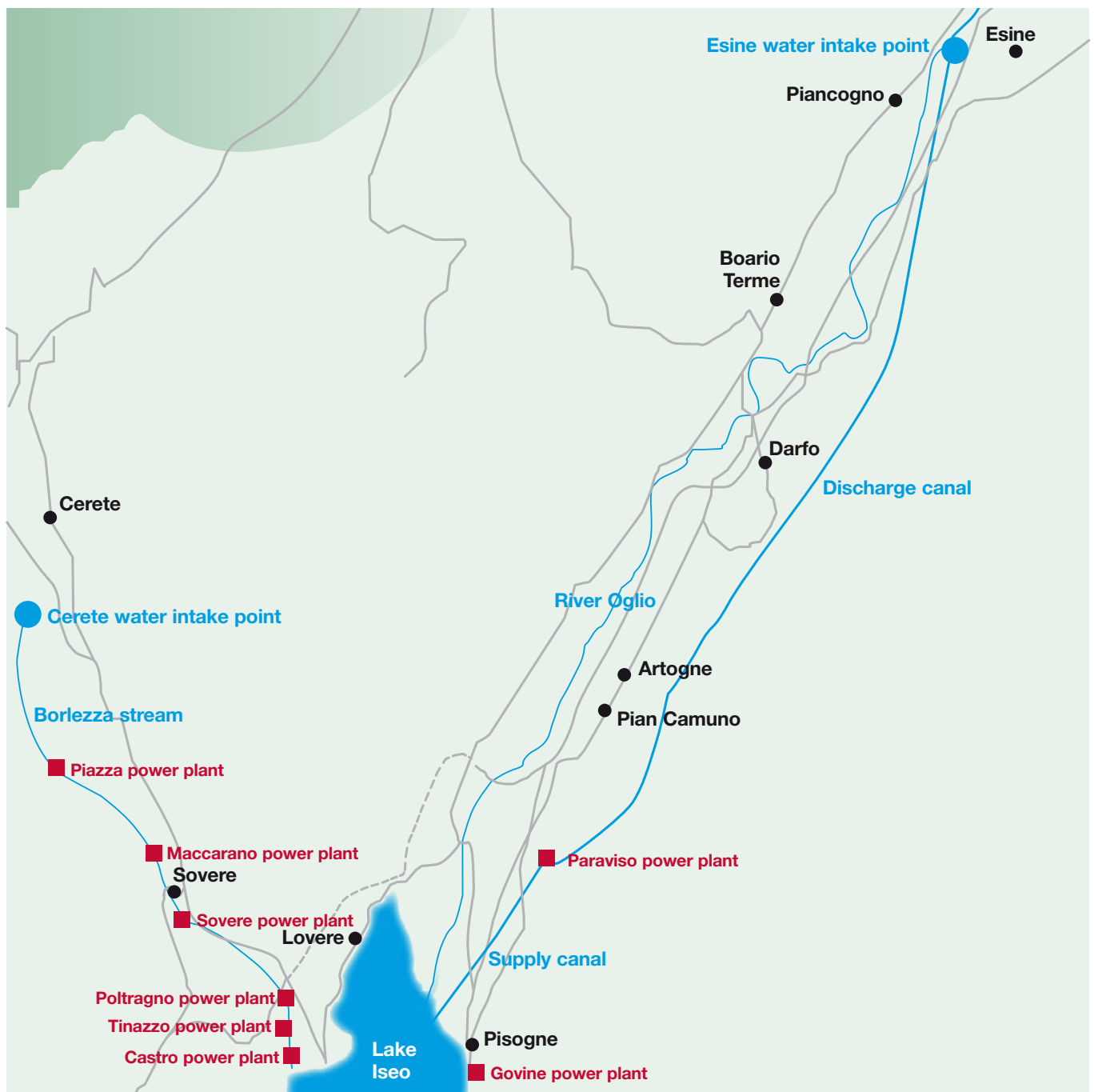


1. Forebay
2. Forebay weir
3. High-pressure line
4. Pressure tank
5. Penstock
6. Machine intake gate
7. Turbine with generator
8. Tailwater

## Technical data

Name	Loc.	Prov.	Headrace	Nominal installed capacity kW	Avg. production last 5 years GWh	Head of water m.	Turbine kW	Turbine Type
Paraviso plant	Pisogne	BS	River Oglio	35800	97.9	56	2 x 17900	Francis
Govine plant	Pisogne	BS	Tufere/Trobiolo source	2000	5.4	203	1803	Pelton
Piazza plant	Sovere	BG	Borlezza stream	750	1.7	72	656	Francis
Maccarano plant	Sovere	BG	Borlezza stream	230	0.8	18	275	Francis
Sovere plant	Sovere	BG	Borlezza stream	220	0.4	14	188	Francis
Poltragno plant	Lovere	BG	Borlezza stream	1700	3.5	73	1639	Francis
Tinazzo plant	Lovere	BG	Borlezza stream	1700	5.5	41	1474	Francis
Castro plant	Castro	BG	Borlezza stream	340	1.1	9	340	semi Kaplan
				<b>42'750</b>	<b>116.3</b>			

## Location map of area





Power plant at Piazza

## Hydroelectric energy: Environmentally friendly and renewable

Hydroelectric energy is clean and renewable. No CO<sub>2</sub> emissions are created during the production of hydroelectric energy; it hence makes no contribution to global warming. In fact, quite the opposite is true: run-of-river power plants help to encourage biodiversity, as the areas surrounding the reservoirs are usually protected conservation sites. Hydroelectric energy therefore ranks among the foremost types of energy production.

Hydroelectric power produced by barrage-type power plants is also the only source of clean energy which can be planned for.

### The most important source of domestic energy

Hydroelectric energy is the most important domestic resource available in Italy, representing 21% of installed gross efficient capacity and supplying 15% of total gross electricity production. Hydroelectric production is concentrated in northern regions such as Lombardia, Piemonte and Trentino Alto Adige, making it at 82% the biggest national contributor to renewable energy production. (Source: TERNA 2008)

## Green Certificates: Added value through clean energy

To add to the company's value, Idroelettrica Lombardia is taking part in the Green Certificates scheme. These are documents issued by electrical system operators certifying the production of energy from renewable sources. Following its investment in the plants at Paraviso, Govine, Poltragno and Tinazzo, each year Idroelettrica Lombardia issues Green Certificates to the equivalent of approx. 30 GWh. These are then transferred to other companies in the electricity market which are obliged to purchase "green" energy quotas against their production of energy from conventional fossil sources.

### Development geared to the future, backed up by one hundred years of history

Hydroelectric energy has been employed for more than a century. Its widespread use today makes it a potential source for developing small facilities as part of the national network.

Against this background, the attention Idroelettrica Lombardia is devoting to smaller plants – in particular those at Piazza, Maccarano and Sovere – makes perfect sense. Their presence in the area goes back nearly one hundred years. Once upgraded, their on-going operation will be guaranteed and will place them in an ever-changing environment quite different from that of the last century.

Our commitment to invest in clean sources of energy is accompanied by a level of investment aimed at upgrading the 3 small hydroelectric power plants with the support of RECS, the Renewable Energy Certificate System, a European project for promoting the development of renewable energy through the issue and marketing of standard certificates.



**Idroelettrica Lombardia** is a partner of RECS Italia and RECS International



Idroelettrica Lombarda Srl  
Head office  
Via G. Fara, 28  
20124 Milan  
Italy  
Tel +39 02 370 11 750  
Fax +39 02 370 11 776

[info@idroelettricalombarda.com](mailto:info@idroelettricalombarda.com)  
[www.idroelettricalombarda.com](http://www.idroelettricalombarda.com)