Introduction of the minimum vital flow in the hydroelectric sector: the experience of the Po river basin

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From the minimum vital flow to the ecological flow

1989

Law 183 establishes that:

…. the set of derivations have to not affect the minimum constant vital outflow in the underlying channels …

how to do ?

It was a generic definition and the task of applying it to individual basins was given to basin authorities through planning tools.

The problem was first tackled in 1990 for the purpose of applying the law to the Valtellina Basin, one of the main Italian hydroelectric districts, on the border with Switzerland.

After an examination of the literature a formula with three components was proposed to the stakeholders:

a hydrological factor, P

an environmental factor, A

an ecological factor, B

Formula Valtellina

$$Dmin = 1,6 \, l \, s^{-1} \, Km^2 \; *P*Q*N$$

D = Minimun Vital Flow

P = Precipitation, It varies according to average annual rainfall : 1,0 – 1,4 – 1,8

Q = Environmental quality factor divided into five classes: from 1 to 1,3

N = Naturalistic factor: 1

How we procedeed?

Through an agreement with the electricity production companies, the local, regional and national administrations concerned, the establishment of an institutional table and a technical table, the definition of provisional release programs and a five-year testing phase for to acquire the elements necessary for a better definition of the minimum vital flow

From the Formula Valtellina to a Formula for the Po basin

The activities conducted in the experimentation in Valtellina have allowed to identify a formulation of the Minimum Vital Flow for the whole Po basin.

This formula is more complex, but in its application the criteria of flexibility in the application, acquisition of data through experimentation, application by degrees to existing derivations have been maintained.

From the minimum vital flow to the ecological flow

In compliance with European indications, a standard has been introduced in the Po basin for maintaining an ecological flow in river beds.

Also in this case the calculation rule and the application criteria are based on principles of subsidiarity and graduality.

The Basin Authority has established a homogeneous approach to the problem.

The nine regions can adapt, based on the criteria provided, the rule and its application to their territorial realities.