



Costs of electricity production and environmental concerns : Small Hydropower Concessions

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Investing in small Hydro is out of fashion ?

No renewable source to produce electricity should be considered out of fashion. Some are more mature and, at the same time, some other technologies are doing their first steps. As the young babies these sources, or more correctly the power plants using these sources, need to be looked for, and protected.

This doesn't mean that the power plants using the more mature technologies should be left with no shelter.

And why the more mature technologies need a shelter?

Because the “real electricity market” do not reflect all the costs effectively incurred by the traditional (and larger) power plants.

The hidden subsidies are not considered, the environmental costs, etc., etc..

The so called shelter should be established with several parameters in mind:

- the technology and its maturity;
- the annual variability;
- the annual production;
- the social / environmental constraints imposed.

Small Hydro is one of the older technologies, if not the oldest.

We should also have in mind that water is one of the goods more request by human kind, and that due to ancient practices with water projects, was not properly protected, and nowadays several restrictions to the water use are pending over small hydro power plants:

- **ecological flows;**
- **fish ladders;**
- **etc..**

These restrictions are reflected in higher costs for the construction and lower electrical production.

Also these projects are subject to a great variability on the occurrence of water (in the southern European countries it can vary from a very dry year to a wet one with a ratio that can be 1 to 4).

Due to the difficulty in obtaining the permits to construct small hydro power plants, it should be taken in consideration, when design them, their reliability and that the equipment can last more than 50 years and quite often they can reach 100 years. Therefore, it is very important that the power plant, and the dam, intake, hydraulic circuit, last similar periods with only minor repairs and interventions.

Another feature that increases the capital cost necessary.

How a small hydro power plant promoter can be compensated by all these setbacks ?

By two ways:

- **a higher tariff;**
- **a long period of concessions.**

A higher tariff is out of question due to the impact this will cause in the final consumer, in the public opinion and that could also be used by the detractors of renewable energy.

The only remaining alternative is the length of the period of concession.

But how long the concession should be ?

Long enough to compensate the investments, and to shelter the investor from the natural variability of flows.

The longer the concession, more interested in building a first quality power plant the investor will be, therefore, better served will be the electric system, because it will be more efficient and more reliable.

The ideal is that the length of the concession should covered a significant part of the life of the structures and equipments.

This can vary from country to country, due to the practices in similar investments.

An acceptable time of concession is 50 years.

But we can have between 35 and 75 years.

And during all the concession period should be granted the feed in tariff?

I don't think so.

It should be granted during a significant period to allow the recovery of the investment done, and in the remaining period it can be applied the market price plus an “environmental prize” or a “green certificate”.

Examples could be:

- **Concession 50 years - tariff guaranteed for 35 years**
- **Concession 75 years - tariff guaranteed for 25 years**
- **Concession 35 years - tariff guaranteed for 25 years**

This depends on the country (or region) policy and also to the state of development of this activity in the country, and also to the country's fiscal regime.

No rule of thumb can be set, but what can be recommended is wisdom, reasonability and a careful analysis of each country (or region) situation.

Another question is:

What will happen after the end of the concession?

Several possibilities can be faced:

- **all structures and equipments revert to the State and the State can proceed to a tender of the power plant for a new period (if the State wants to give a special right to the previous owner the possibility of a right of preference for the highest bid can be granted to him);**
- **an extension of the concession can be negotiated with the owner, for example two years before the end of the concession, and if a settlement is not reached, the State will proceed to a tender.**

As a last remark I want to raise a new, at least in Portugal is new, challenge for the small hydro power plant business:

One of the problems of most the technologies for producing electricity from renewable sources have is that the sources are not controllable, but they can be predicted, with a certain degree of confidence and within, at least, a few days.

A solution for this problem is the capacity of storage of energy, not necessarily in the form of electricity.

Pump-storage in reversible hydro power plants has been for many years a reliable system to transfer energy from periods when the resource exceeds the consumption to periods when the consumption exceeds the resource.

Why can't we have small hydro power plants reversible ?

For no reason.

How should these power plants be remunerated ?

**Lets think on this and give another boost to
our sector**