



## **Biron Hydropower Plant**

- Background information and decision -

28 October 2015

### 1. Background of the Decision

The French electricity supplier Planète OUI has decided to sign the EKOenergy License Agreement. The company will become the first French supplier of EKOenergy certified electricity

The company will sell a product composed of several renewable energy sources. They absolutely want to have hydropower in their mix. To show consumers that production of renewable electricity can at any time be in balance with demand for renewable electricity. They have a strong preference for French hydropower.

There are about 2250 hydropower plants in France (mainland). However, it has turned out a complex process to find suitable power plants.

- A lot of the produced electricity (and the corresponding Guarantees of Origin) is in the hands of larger electricity companies who turned out not to be interested in selling to other market players.
- On top, French subsidy regulations limit the commercialisation of Guarantees of Origin of power plants which receive a subsidy.

We have been in contact with tens of different stakeholders before finding the power plant of Biron-Castétis, which we describe hereafter.

### 2. Description of the power plant at Biron-Castétis

The hydropower plant of Biron-Castétis is located at Biron-Castétis (South west of France, Pyrenees-Atlantiques department), between Pau and Orthéz, on the river Gave de Pau.

The Gave de Pau is a river of south-western France and a left tributary of the Adour. It takes its name from the city Pau, through which it flows. The river is 180 kilometres long, and its source is at the Cirque de Gavarnie in the Pyrenees mountains.

The Gave de Pau has 28 hydroelectric plants. 17 are located in the department of Pyrénées Atlantiques, 11 in the department High Pyrenees.

The power plant of Biron-Castétis has a capacity of 1,7 MW. There are 2 vertical Kaplan turbines. The height difference is 3,6m. The power plant can take 110m<sup>3</sup>/s (55

m<sup>3</sup>/s for each turbine). The turbines make up to 89 turns per minute.

### 3. Nature at the Gave de Pau

The river bed of the Gave de Pau has been designated as Natura 2000 area, e.g. for following species: Freshwater Pearl Mussel, Freshwater White-clawed Crayfish, Brook Lamprey, Atlantic Salmon and Bullhead (<http://inpn.mnhn.fr/docs/natura2000/fsdpdf/FR7200781.pdf>)

Migratory species are gradually returning to the Gave thanks to arrangements made crossing in recent years on some of the many dams built on its course.

### 4. Fish passage at the power plant of Biron

The power plant of Biron has a functioning fish passage, consisting of a canal which runs parallel to the river on the place where the dam is located ('rivière de contournement'). It can clearly be seen on the photo and plan hereafter.

About the fish passage, we got the following comment from local fishers: *This artificial branch is the best fish passage which can exist. It allows the fishes, the sea lampreys, the eels and all the others species to migrate.*



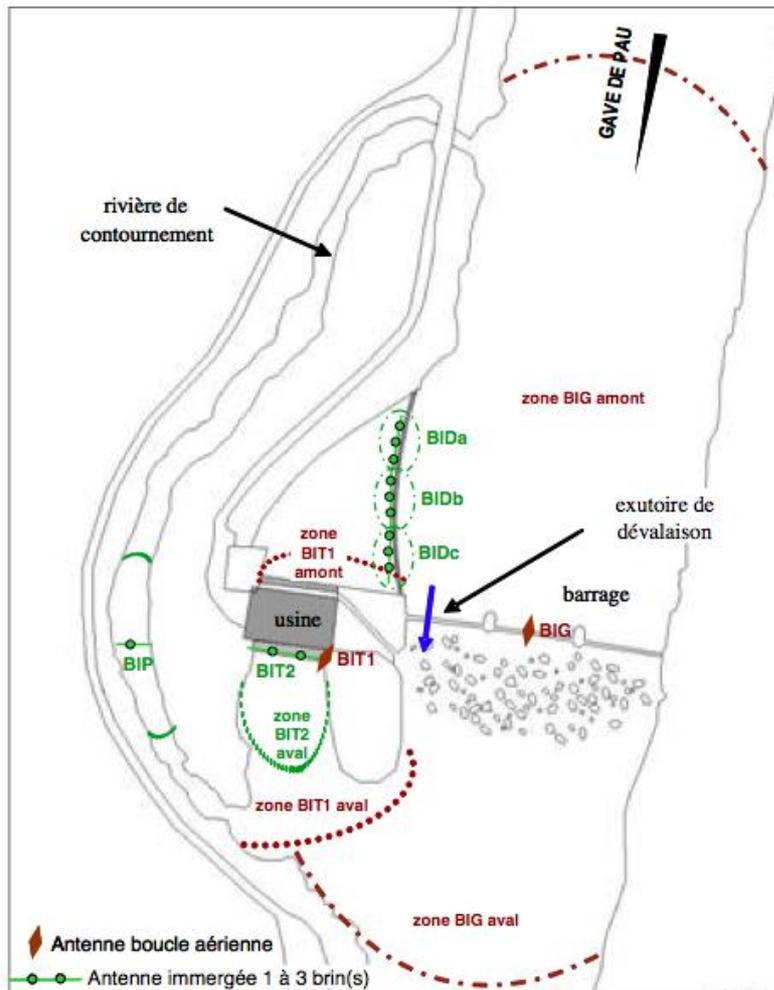


Figure 3.6 : Localisation des antennes et des zones de réception au niveau de l'aménagement de Biron

## 5. Challenges / problems

As described above, the power plant has 2 groups of Kaplan turbines and the height difference is 3,6 meters. This setting makes can lead (or leads) to a high mortality of eels. Is the site with highest eel mortality on the Gave de Pau.

This has been studied in 2008. See [http://www.onema.fr/IMG/pdf/2008\\_026.pdf](http://www.onema.fr/IMG/pdf/2008_026.pdf)

Eels can cross the dam by several means:

- when the water flow is enough high, they can go over the dam or by a valve which is on the right side of the dam, on the surface.
- They can also cross thanks to the artificial river.
- The other place for them to cross is the turbines

The place where the eels cross the obstacle depends on the water flow.of the river. (more crossing when the water flow is less than 150 m<sup>3</sup>/s p.80).

At the front of the turbines, there are railings which have a specific inclination and a specific distance between bars (p85). The more the railings are inclined compared to the flow axis (better if the railings aren't at 90° compared to the flow axis) and the less the distance between bars, the less eels go through the turbines. For this hydropower plant, in 2009-2010, the distance between bars was very high (8cm) compared with the others hydropower plants which are on Gave de Pau, and the inclination was 90° compared to the flow axis.

-> In 2011, sonar systems have been tested to scare eels away of the turbines, but the test were not successful. The findings have been published in the report 2Anguille et ouvrages : migration de dévalaison. Test d'un dispositif de répulsion à infrasons au droit de deux ouvrages hydroélectriques sur le Gave de Pau, Evaluation of an infrasound fish repulsion system at two hydroelectric power plants on the Gave de Pau River (Authors: Bau, F. ; Lafitte, J. ; Baran, P. ; Larinier, M. ; Travade, F. ; De Oliveira, E.)"

(<http://cemadoc.irstea.fr/oa/PUB00034967-anguille-ouvrages-migration-devalaison-test-8217-d.html>)

-> We have not been able to find out yet what is the difficult in changing the bars. We also don't know why this measure isn't mentioned anywhere (E.g. not in Programme De Mesures du bassin Adour-Garonne. mentioned in Annex 1.

-> This problem has not been mentioned by anyone we have interviewed so far. But we will study this further.

## 6. Decision and follow up

EKOenergy Licensees can sell the electricity from the Biron power plant as EKOenergy. This decision is valid until 1 November 2020.

Reasoning:

- Under the French subsidy system, electricity cannot be marketed as renewable electricity if its production is subsidised. This makes it difficult to sell French wind energy or French solar energy. Also most of the recently renovated hydropower plants are under the so called "tarif d'achat"
- We appreciate the willingness of Planète OUI to experiment with EKOenergy in France and we want to go for it with them.
- We are not (yet) in a position to judge the full ecological impact of the Biron hydropower plant. Rather, we consider the hydropower on the Gave du Pau, and the problems it is bringing with it, as interesting challenges. We want to continue to follow up the situation, not from the sideline, but as an involved stakeholder. We particularly want to see if, how and to what extent we can play a positive role in the ongoing dynamics. E.g. via the exchange of experiences, via the contributions of our fund, or by developing new projects (the latter is only realistic if EKOenergy breaks through in France).
- We aim at continuing our interaction with all other involved stakeholders and in particular with nature conservation organisations and fishers.

Follow up:

The contributions to EKOenergy's Environmental Fund, resulting from the sales of EKOenergy in France COULD be used for:

- Small scale projects around the power plant. In particular measures to diminish eel mortality or conservation measures in a nearby riparian forest (as recommended by local fishers).
- Any other project to be decided in cooperation with French river activists.

## **Annex 1. River basin management plan "SDAGE Adour-Garonne"**

### **a. See also**

<http://www.eau-adour-garonne.fr/fr/quelle-politique-de-l-eau-en-adour-garonne/accueil-sdage-brouillon/documents-du-sdage-et-du-pdm.html>

### **b. Programme De Mesures du bassin Adour-Garonne 2010 - 2015.**

P. 82: Chapter of the area of les Gaves, paragraph about "Modification des fonctionnalités"

- *Restaurer les zones de frayère APNE C*
- *Lutter contre les espèces invasives (gestion et sensibilisation)*
- *Entretenir, préserver et restaurer les zones humides (têtes de bassins et fonds de vallons, abords des cours d'eau et plans d'eau, marais, lagunes...) :*
- *interdire le drainage ou l'envoyage des zones humides abritant des espèces protégées ou des zones humides inventoriées pour leurs fonctionnalités hydrologique et/ou biologique,*
- *procéder à des acquisitions foncières dans les zones humides,*
- *développer le conseil et l'assistance technique aux gestionnaires de zones humides*
- *Entretenir les berges et abords des cours d'eau ainsi que les ripisylves*
- *Agriculteurs-Collectivités-*
- *Restaurer et entretenir les annexes hydrauliques des cours d'eau Collectivités-APNE C*
- *Déterminer les espaces de mobilité des cours d'eau Collectivités C*
- *Limiter ou interdire la création de plans d'eau et limiter l'impact des plans d'eau existants*
- *Accompagner et sensibiliser les acteurs sur les interventions sur les milieux (techniciens rivières, guides techniques,...)*
- *Aménagement des ouvrages pour favoriser le transport solide*

### **c. Programme De Mesures du bassin Adour-Garonne 2016 - 2021. (Draft)**

P. 43 Chapter about the area of les Gaves, paragraph about "Gestion des cours d'eau - continuité"

- *Aménager ou supprimer un ouvrage (à définir)*
- *Aménager un ouvrage qui contraint la continuité écologique (espèces ou sédiments)*
- *Coordonner la gestion des ouvrages*
- *Supprimer un ouvrage qui contraint la continuité écologique (espèces ou sédiments)*