



recharge.green – balancing Alpine energy and nature

The Alps have great potential for the use of renewable energy. Thereby they can make a valuable contribution to mitigating climate change. This, however, means increasing pressures on nature. What could be the impact of such changes on the habitats of animals and plants? How do they affect land use and soil quality? How much renewable energy can reasonably be used? The project recharge.green brings together 16 partners to develop strategies and tools for decision-making on such issues. The analysis and comparison of the costs and benefits of renewable energy, ecosystem services, and potential trade-offs is a key component in this process. The project will last from October 2012 to June 2015 and is co-financed by the European Regional Development Fund in the Alpine Space Programme.

www.recharge-green.eu

Select the renewable energy source:

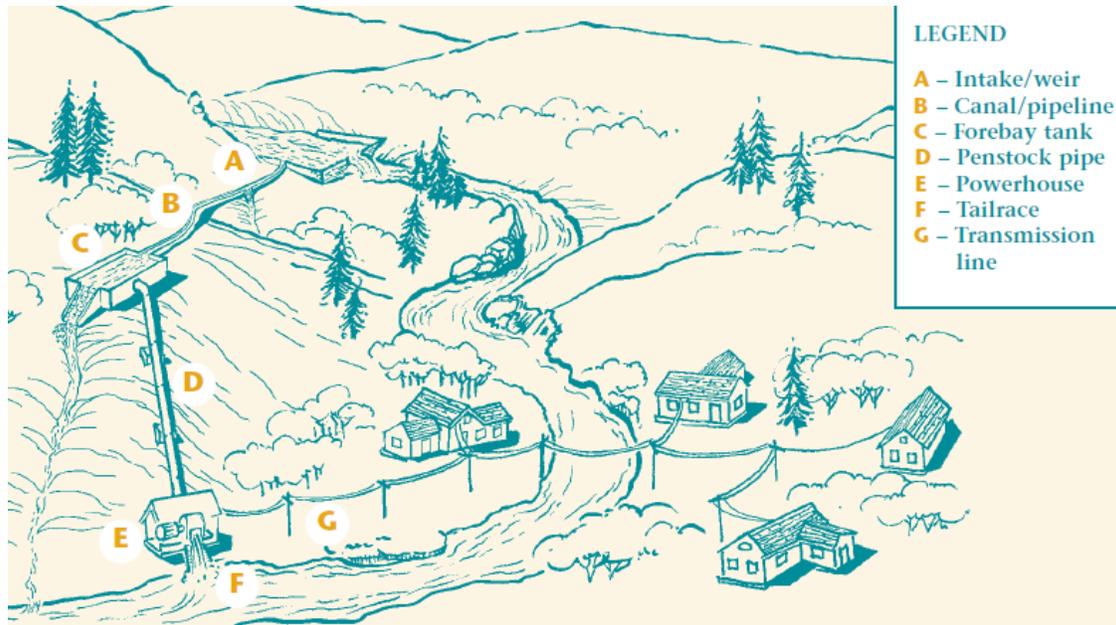
Forest Biomass

Forest Biomass is the term that technically identifies the amount of wood that can be found in a forest. Alpine forest are generally cultivated for wood products and forest biomass can provide different products, some of them can be used to produce energy. In the whole length extraction method, each whole tree that is cut is extracted and then the parts that are used for construction wood or quality planks are separated from the residues. In the Alps, forest biomass for energy comes mainly from wood residues, that is bark, branches and tree tops that have no other more commercially convenient utilization and are transformed to chip woods. If used in a sustainable way, forest biomass can contribute to produce energy, to achieve carbon sequestration goals and can significantly help to maintain local enterprises and activities in Alpine communities. Forest biomass can be used for example to produce heat or to produce heat and power in cogeneration plants. The r.green.biomassfor model scenarios are based on the assumption that forest management plans indications are always respected in order to avoid an unsustainable overexploitation of forest ecosystems. Let's try some scenarios hands on?

Hydropower

Hydropower is power derived from the energy of falling water or running water that may be harnessed. Nowadays, hydropower is well developed in the Alps and it remains few places to build new power plants that produce a large power (> 20 MW). The current potential concerns small hydropower (< 20 MW) so the structure suggested in the technical and economic parts is the one for small hydropower. The structure of the plant is detailed in the picture below. It is composed of an intake (A) which diverts water from the river. This water is conveyed into a derivation channel (B) with a very low slope and arrives in a forebay tank (C) which regulates the fluctuation of discharge. Finally, the penstock (D) conveys the water with the highest possible head to the turbine-alternator group (E) which produces electricity. The water is then

released in the river (restitution F). We use the following vocabulary: the structure of the plant corresponds to the part with the derivation channel and the penstock, whereas the segment of the plant corresponds to the part of the river (water not diverted) between the intake (A) and the restitution (F).



Picture of the plant structure taken from *Micro-hydropower Systems - A Buyer's Guide*, Natural Resources Canada, 2004