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A GIS based European Hydro Power Atlas: a tool for technical and economical feasibility assessment

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The service consists of a tool for quick technical and economic feasibility assessment of small hydropower sites, based on topography, hydrology, environmental flows and other constraints such as distance from existing electric grids. The system works in a web-mapping wrap and allows analysis at a scale comparable to common geo-browsing tools (such Google Earth ©), just like e.g. popular JRC's PVGIS for the estimation of photovoltaic potential. The system provides basically two levels of operation: (1) mapping of the hydropower potential at Europe or regional scale, and (2) preliminary assessment of hydropower production at a site specific level. In the first level, a map of the potential production is provided taking into account a predefined length of the diversion of water (derivation channel and penstock) and calculating related Hydraulic jump; the system combines then topographic information together with flow duration curve information for the whole European/regional stream network and operative hypothesis on maximum derivable flow and other relevant derivation parameters. In the second level user defines in detail project parameters (amount of withdrawal, length of derivation, distance from connection grid, type of turbine, local feed in tariff) and the system evaluates preliminary feasibility check (size of the plat, maximum allowed investment for a fixed for a payback time). Interface via Google Map/Earth © or similar geo-browsing tools will be provided. This tool is expected to play a role in promoting investment in pico-to micro-hydropower plants by making preliminary feasibility assessment much quicker and affordable, and providing reliable estimation of potential available resource, which may be a critical aspect in the development of small plants and for site scouting activity

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