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From: Michael Ward [REDACTED]
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To: PLANNING CPU
Subject: donegaldevplan
Attachments: renewable storage.docx

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Donegaldevplan

Renewable electrical energy in Ireland presently comes from wind turbines and solar panels. Both systems reduce carbon emissions and reduce dependence on imported fossil fuels. At this point in time, wind energy is the preferred and most widely used reducer of carbon emissions. Both renewable systems however have some disadvantages. Solar panels do not work in the dark, wind does not always blow. However it is possible to reduce these disadvantages by a considerable degree. This can be done by having a suitable storage system for renewal energy. Two such systems already exist . High capacity batteries are increasingly being used to store energy especially from solar panels as they are non-productive at night time. A pumped hydro system exists at Turlough Hill in Wicklow. It was commissioned in 1974 at a cost of 22 million pounds. There are two reservoirs separated by a vertical distance of 270 metres. Each reservoir can hold 2.3 million cubic metres of water on alternate cycles. At peak demand time for electricity the water is allowed to flow through a penstock to turn water turbines at a lower level. 275 Megawatts of electricity can be generated for 8 hours at Turlough Hill by this method. The water is pumped back up to the upper reservoir at night time using excess electricity available, usually from wind turbines but in the past ,from steam stations.

There are 170 pumped hydro systems in Europe with plans to build 60 more with a generating capacity of 27 Gigawatts. Ireland, so far, has one pumped hydro system. For such a system to be economical the minimum head required is 150 metres, the maximum distance between the reservoirs is around 5 Kilometres and the recommended distance of the actual generating station from habitation is 200 Metres minimum.

Iceland has 77% of its electricity generated from Hydro systems. In Ireland the amount of electricity generated from hydro presently only amounts to 3%.Demand for electricity in Ireland in 2011 was 5,672 Megawatts per capita. Also in 2011 the World Bank Collection of Development Indicators stated that Ireland in that year had used 287,023,000,000 Kilowatts of electricity. Ardnacrusha using water from the Shannon is the oldest hydroelectric generating station in Ireland. It was commissioned in 1929 . It is still in use and will be for some years yet to come. In 1929 it supplied 100% of the country's electricity but now because of increased demand and other generators it can only supply 2.8% Ireland and Donegal in particular has plenty of hills well over the minimum height of 150 metres required for viable pumped hydro systems. The building of such a system can generate hundreds of jobs during construction and a number of permanent jobs when in operation. Turlough Hill took 5 years to complete and now employs 16 permanent staff. Pumped Hydro storage can ensure energy security possibly for the next 100 years. It could eliminate the dependency on a European interconnector bringing energy from nuclear power stations. It could also incorporate a tourism and science facility providing interesting visitor centres and scenic viewpoints.

It is a fact that wind farms can be more economical if night time electricity could be stored using batteries or by having a pumped hydro system. A report shows that in 2017 wind turbines generated 532 Megawatts of electricity thereby saving 278 million euro on imported fossil fuels. There are a number of wind farms in Donegal that have to be curtailed at night as the electricity is not being used. A storage system could ensure that cheap power would be made available for peak demand times.

Pumped hydro is a long lasting, clean, environmentally friendly and safe means of generating carbon free electricity. The hills of Donegal offer an ideal location for a few pumped hydro systems. Perhaps the energy providers can begin to examine the possibility of initiating this necessary and exciting proposal that would make Donegal a major supplier of electricity.

Ps Perhaps the County Councils should be encouraged to identify locations suitable for pumped hydro schemes when drawing up their County Development Plans.

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