

## Appendix 11: Cadamstown Hydro Resource

Hydro resources were an extremely important part of the commercial and industrial life of most Irish towns through the 18, 19 and early 20<sup>th</sup> Century. The Mills and millraces that used waterwheels and turbines to grind oats, wheat, skutch Flax, drive dairies and textile mills dominate many towns. Later many were converted to producing electricity and some of the larger ones continue to produce electricity to the present day.

In the Department of Energy “Small scale Hydroelectric Potential in Ireland” published in 1985 over 3,446 sites were examined and 568 sites were rated. Table 1 below gives the overall results.

	<i>Operating</i>	<i>Good</i>	<i>Fair</i>	<i>Marginal</i>	<i>Total</i>
No of Sites	85	112	146	225	568
Installed Capacity (kW)	4416	16620	9859	7188	38083
Annual Energy Output (Mwh)	19600	82544	54172	37217	193533

**Table1: Small Scale Hydroelectric Potential in Ireland**

### **Cadamstown**

Cadamstown had a Mill until the mid twentieth century. The mill used a large 4.5 5 M diameter water wheel and had almost 5 metres of a head. The Mill is now largely derelict and the original millrace is largely filled in. The mill building is a stone building with some potential development potential.

### **Reliability of the Cadamstown Hydro Scheme**

This survey is interesting as it indicates the large number of potential small-scale hydro sites in Ireland. It would seem that only the lack of a secure market for their electricity has hampered their development. This is unfortunate as many sites have intact millraces, mills, weirs and other high value capital equipment. Many of the potential hydro sites in Ireland are in ideal locations in the centre of towns and villages and would be extremely useful in terms of spatial planning and developing of jobs within town centres. Connection to a local mingrid would transform their financial violability.

### **Rationale**

Cadamstown project should consider using the more expensive but more reliable electricity from its local hydro resource to enhance the inexpensive power from the wind turbine. This would allow much greater control of supply/demand imbalances and considerably reduce the import of expensive power from the national grid during peak periods.

### **Project Description**

Instead of relying on the existing 5-6 metre resource used for the original mill, it is planned to build a small dam higher up the river to get about 30 metres of a head and to add storage to the system. There is a narrow valley at a location about 1.2 km upstream which would be suitable for a small

dam. The Silver River is a spate river and is subject to large variations in flow. The average flow is estimate at about .5 M<sup>3</sup>/sec. Taking a net head of 25 Metres and an efficiency of .85 we would have sufficient resource for about 700kwh. An earthen dam could be constructed with a concrete spillway. The dam would be about 15 metres long and 3 metres high. It is estimated that the dam would hold back about 750 cubic metres of water. This would give approx 45whr of storage and would allow an additional 15 kW to be produced per hour during the winter peak hours.

A 200 kW Kaplan turbine has a capability to maximise production during the wetter winter months. This turbine gives good efficiency in low flow conditions. It will also, in conjunction with the dam, facilitate load matching of up to 200kW for 20 minutes on demand. The Penstock consists of 1000 Metres of a 25 cm low-pressure water pipe and the remaining 200 metres would be a 12.5 cm penstock. The estimated annual production for this set up is 700,000 kWh.

### Capital Cost Estimate

<i>Item</i>	<i>Euros</i>
Penstock	25000
Civil engineering	150000
Turbine	175000
Debris control	20000
Electronic Control	35000
Connection	25000
Fish pass	12000
Valves and instrumentation	20000
<b>Total</b>	<b>462000</b>

### Fig.2 Capital Cost Estimate

#### Other Benefits of the Dam

It would be advantageous to build a walking path along the penstock, which will allow the village easy access to the Dam. A minimum level of water can be kept in the dam for water sports in the summer month. The walk and water feature will greatly increase the tourist potential of the village and will enhance the quality of life for the village as there no other lakes in the county region. It is considered reasonable that tourism interests could provide 25% of the cost of the dam and the path.

Cadamstown has a group water scheme under demand from an area as far distant as Kinnity. The proposed dam and the penstock can be used to supply water to the village in conjunction with a separate grey water supply and treatment system. It is estimated that 25% of the cost of the penstock and dam could be obtained from funds for community water supplies