

Small Scale Hydro Calculator

Name/Location of Watercourse: **Corrie Cozrich, Glen Almond**

Intake Elevation (m) Kinematic Viscosity

Turbine Elevation (m) Roughness Coef (mm)

Head (m)

Pipe Length (m)

Hydraulic Gradient

Turbine Eff. (%)

Low Flows Summary

Annual	Monthly											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Annual mean flow	0.055											
Annual Q95 (m³/s)	0.032											
P (%)	5	10	20	30	40	50	60	70	80	90	95	99
Q (m³/s)	0.201	0.136	0.082	0.065	0.039	0.028	0.02	0.014	0.009	0.005	0.003	0.002
Monthly mean Q95	0.086 m³/s	0.072 m³/s	0.068 m³/s	0.043 m³/s	0.027 m³/s	0.021 m³/s	0.024 m³/s	0.034 m³/s	0.048 m³/s	0.073 m³/s	0.076 m³/s	0.088 m³/s
Q (m³/s)	0.296	0.299	0.228	0.144	0.099	0.078	0.089	0.133	0.19	0.241	0.253	0.293
P (%)	5	10	20	30	40	50	60	70	80	90	95	99
Q (m³/s)	0.208	0.179	0.159	0.1	0.066	0.048	0.06	0.089	0.126	0.186	0.187	0.217
Q (m³/s)	0.136	0.108	0.101	0.061	0.036	0.028	0.034	0.05	0.075	0.115	0.117	0.139
Q (m³/s)	0.086	0.077	0.073	0.041	0.022	0.019	0.022	0.031	0.048	0.08	0.083	0.097
Q (m³/s)	0.071	0.057	0.055	0.031	0.016	0.014	0.015	0.021	0.033	0.057	0.065	0.072
Q (m³/s)	0.053	0.043	0.044	0.025	0.012	0.01	0.01	0.014	0.023	0.043	0.049	0.052
Q (m³/s)	0.04	0.032	0.034	0.02	0.009	0.008	0.007	0.01	0.015	0.032	0.036	0.038
Q (m³/s)	0.03	0.024	0.025	0.016	0.007	0.006	0.005	0.007	0.011	0.023	0.027	0.028
Q (m³/s)	0.021	0.017	0.018	0.012	0.006	0.004	0.004	0.005	0.006	0.015	0.02	0.02
Q (m³/s)	0.014	0.011	0.013	0.008	0.004	0.003	0.003	0.003	0.004	0.009	0.014	0.014
Q (m³/s)	0.01	0.008	0.01	0.007	0.003	0.002	0.002	0.002	0.003	0.007	0.01	0.01
Q (m³/s)	0.007	0.006	0.007	0.005	0.002	0.001	0.001	0.001	0.002	0.004	0.006	0.005

Cost of System

Sizing Turbine

Turbine Rating (kW)

Chosen Pipe Diameter (m)

Operational Range

Rated Flowrate (m³/s)

Cut in flow Cut out flow

Cost Breakdown

Est. Pipe Cost (per m)

Est. Cost of Pipe

Est. Cost of Turbine

Groundwork/Power House include the costs for powerhouse

Transmission Distance (km)

Overhead

Underground

Est. Transmission Cost

Est. CapEx

Est. OpEx

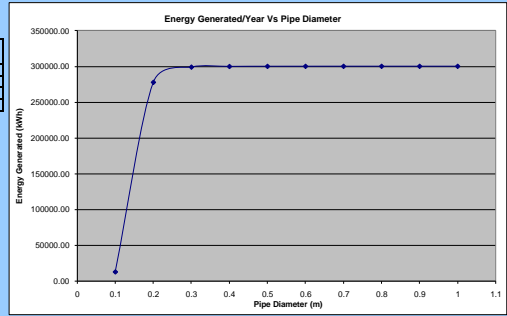
Feed-in Tariff

FITS Range	Generation Price (£)	Export	Total
< 15kW	0.199	0.03	0.229
> 15 - 100 kW	0.178	0.03	0.208
> 100kW - 5MW	0.11	0.03	0.14
> 5MW - 5MW	0.045	0.03	0.075

Tariff Price

Revenue Forecast

Pipe Diameter (m)	Energy Generated per year (kWh)	Revenue per year (£)
0.1	13220.93	£2,749.95
0.2	277860.14	£57,794.91
0.3	299116.34	£62,216.20
0.4	299952.27	£62,390.07
0.5	300134.73	£62,426.02
0.6	300190.13	£62,439.55
0.7	300210.83	£62,443.85
0.8	300219.78	£62,445.71
0.9	300224.06	£62,446.61
1	300226.33	£62,447.08



Payback Period

Tax rate %

Long term interest rate %

Long term inflation rate %

% of profits to debt repayment %

Turbine (kW)

Pipe Dia. (m)

Year	Investment	Generation	Debt Interest	Annual OpEx	Total	Pre-Tax	Net	Cumulative	Debt Capital
	Balance	Income	Repayment		Outgoings	Profit/Loss	Profit/Loss		Profit/Loss
1	£240,067	952,216	£16,805	£11,850	£28,655	£33,562	£21,815	-£218,252	£8,290
2	£231,777	953,461	£16,224	£12,087	£28,311	£35,149	£22,847	-£196,405	£8,682
3	£223,095	954,730	£15,617	£12,369	£27,965	£36,794	£24,910	-£171,496	£9,086
4	£214,010	956,024	£14,981	£12,651	£27,586	£38,489	£27,004	-£146,491	£9,502
5	£204,508	957,345	£14,316	£12,827	£27,142	£40,202	£28,132	-£120,359	£9,930
6	£194,578	958,692	£13,620	£13,083	£26,704	£41,988	£27,292	-£93,067	£10,371
7	£184,207	960,066	£12,894	£13,345	£26,260	£43,828	£26,497	-£65,580	£10,826
8	£173,392	961,467	£12,137	£13,612	£25,749	£45,718	£24,711	-£38,863	£11,292
9	£162,090	962,896	£11,346	£13,884	£25,230	£47,666	£23,003	-£13,881	£11,773
10	£150,316	964,354	£10,522	£14,162	£24,684	£49,670	£21,366	£28,405	£12,269
11	£138,096	965,841	£9,663	£14,445	£24,199	£51,733	£19,800	£48,205	£12,778
12	£125,470	967,356	£8,769	£14,734	£23,693	£53,855	£18,306	£67,511	£13,302
13	£112,487	968,905	£7,838	£15,029	£23,166	£56,039	£16,876	£85,387	£13,842
14	£99,126	970,483	£6,869	£15,329	£22,188	£58,282	£15,500	£102,887	£14,396
15	£85,379	972,092	£5,861	£15,636	£21,497	£60,586	£14,167	£119,054	£14,962
16	£71,252	973,733	£4,813	£15,949	£20,792	£62,951	£12,872	£133,926	£15,544
17	£56,762	975,404	£3,725	£16,268	£19,992	£65,417	£11,715	£147,641	£16,158
18	£41,909	977,105	£2,598	£16,593	£19,188	£67,891	£10,685	£160,326	£16,799
19	£26,701	978,833	£1,431	£16,925	£18,344	£70,374	£9,788	£172,054	£17,458
20	£11,148	980,587	£200	£17,263	£17,463	£72,874	£9,016	£182,820	£18,135