

Small Scale Hydro Calculator

Name/Location of Watercourse:

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	0.13											
Annual Q95 (m³/s)	0.025											
P (%)	5	10	20	30	40	50	60	70	80	90	95	99
Q (m³/s)	0.22	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Monthly mean Q95	0.22	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
P (%)	5	10	20	30	40	50	60	70	80	90	95	99
Q (m³/s)	0.597	0.447	0.317	0.234	0.189	0.156	0.126	0.103	0.085	0.067	0.058	0.047
Q (m³/s)	0.661	0.414	0.269	0.198	0.162	0.132	0.106	0.083	0.068	0.047	0.042	0.036
Q (m³/s)	0.513	0.378	0.254	0.193	0.154	0.121	0.096	0.078	0.065	0.045	0.044	0.035
Q (m³/s)	0.32	0.237	0.163	0.129	0.108	0.093	0.079	0.067	0.059	0.049	0.044	0.038
Q (m³/s)	0.203	0.144	0.098	0.078	0.066	0.058	0.049	0.043	0.037	0.032	0.029	0.025
Q (m³/s)	0.138	0.105	0.072	0.059	0.049	0.042	0.036	0.032	0.029	0.025	0.021	0.018
Q (m³/s)	0.13	0.093	0.061	0.059	0.048	0.042	0.033	0.029	0.025	0.021	0.018	0.016
Q (m³/s)	0.219	0.154	0.094	0.084	0.074	0.068	0.058	0.054	0.047	0.042	0.034	0.029
Q (m³/s)	0.336	0.233	0.141	0.128	0.111	0.101	0.089	0.088	0.074	0.061	0.054	0.043
Q (m³/s)	0.468	0.357	0.238	0.226	0.191	0.173	0.155	0.141	0.123	0.105	0.094	0.081
Q (m³/s)	0.506	0.384	0.27	0.266	0.218	0.194	0.175	0.161	0.143	0.123	0.115	0.099
Q (m³/s)	0.561	0.422	0.286	0.278	0.218	0.194	0.175	0.161	0.143	0.123	0.115	0.099

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 include the costs for powerhouse

Transmission Distance (km)

Overhead

Underground

Est. Transmission Cost

Est. CapEx

Est. OpEx

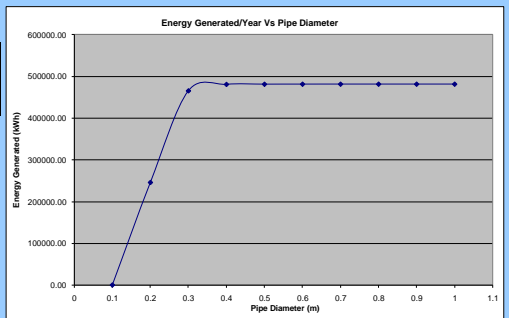
Feed-in Tariff

FTTS 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	0.0	£0.00
0.2	246098.01	£51,188.39
0.3	465961.05	£96,919.90
0.4	481450.10	£100,141.62
0.5	481655.77	£100,236.00
0.6	481978.95	£100,251.62
0.7	482024.98	£100,261.20
0.8	482044.87	£100,265.33
0.9	482054.44	£100,267.32
1	482059.45	£100,268.37



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	Repayment
1	£985,623	£96,920		£82,694	£11,850	£74,544	£22,378	£14,545	£881,078
2	£881,078	£98,858		£81,675	£12,087	£77,762	£25,096	£16,312	£864,766
3	£784,786	£100,835		£80,534	£12,302	£77,262	£27,974	£18,183	£846,584
4	£686,584	£102,851		£79,261	£12,525	£77,326	£31,018	£20,161	£826,561
5	£586,423	£104,909		£77,850	£12,677	£77,076	£34,233	£22,251	£804,172
6	£484,172	£107,007		£76,292	£12,853	£69,375	£37,632	£24,461	£779,711
7	£379,711	£109,148		£74,580	£13,045	£67,566	£41,224	£26,796	£752,916
8	£272,916	£111,330		£72,704	£13,252	£65,516	£45,014	£29,261	£723,657
9	£173,657	£113,557		£70,656	£13,474	£63,441	£48,917	£31,861	£691,796
10	£81,796	£115,828		£68,426	£13,711	£61,117	£53,241	£34,606	£657,189
11	£67,189	£118,145		£66,003	£13,963	£58,448	£57,656	£37,500	£620,634
12	£51,687	£120,508		£63,378	£14,231	£55,712	£62,365	£40,577	£581,057
13	£34,914	£122,918		£60,539	£14,515	£52,383	£67,350	£43,778	£538,279
14	£17,352	£125,376		£57,475	£14,815	£48,804	£72,572	£47,172	£488,180
15	£888,180	£127,884		£54,173	£15,130	£45,008	£78,025	£50,746	£431,431
16	£437,431	£130,441		£50,820	£15,460	£41,548	£83,773	£54,517	£369,914
17	£382,914	£133,050		£47,804	£15,804	£37,246	£89,979	£58,486	£302,428
18	£324,428	£135,711		£44,110	£16,163	£32,553	£96,408	£62,666	£231,762
19	£261,762	£138,425		£39,733	£16,536	£27,243	£103,177	£67,051	£158,697
20	£194,697	£141,194		£34,679	£16,934	£22,260	£110,302	£71,696	£81,696