

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
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	0.053	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	0.056	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	0.048	0.041	0.037	0.033	0.029	0.025	0.021	0.018	0.016
Q (m³/s)	0.219	0.154	0.094	0.064	0.048	0.039	0.034	0.029	0.025	0.021	0.018	0.017
Q (m³/s)	0.336	0.233	0.141	0.084	0.048	0.039	0.034	0.029	0.025	0.021	0.018	0.017
Q (m³/s)	0.468	0.357	0.238	0.182	0.138	0.111	0.089	0.068	0.051	0.044	0.034	0.029
Q (m³/s)	0.506	0.384	0.27	0.206	0.151	0.123	0.099	0.078	0.061	0.044	0.034	0.029
Q (m³/s)	0.561	0.422	0.286	0.218	0.161	0.135	0.115	0.094	0.075	0.059	0.043	0.038

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

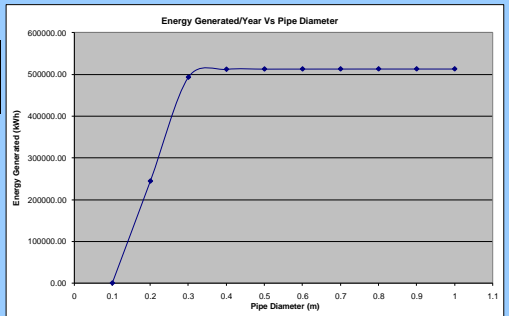
Feed-in Tariff

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	244413.83	£34,217.94
0.3	493471.82	£69,086.06
0.4	512416.52	£71,738.31
0.5	513098.47	£71,821.19
0.6	513178.55	£71,845.00
0.7	513242.08	£71,853.89
0.8	513267.47	£71,857.45
0.9	513279.44	£71,859.12
1	513285.70	£71,860.00



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	£320,423	£69,086	£22,430	£12,550	£34,980	£34,106	£22,169	-£298,254	£22,169
2	£298,254	£70,468	£20,878	£12,801	£33,679	£36,789	£23,913	-£274,341	£23,913
3	£274,341	£71,877	£19,204	£13,067	£32,261	£38,616	£26,751	-£248,590	£26,751
4	£248,590	£73,316	£17,491	£13,338	£30,719	£42,956	£27,667	-£220,924	£27,667
5	£220,924	£74,781	£15,743	£13,585	£29,048	£45,753	£29,727	-£191,177	£29,727
6	£191,177	£76,277	£13,982	£13,856	£27,239	£49,038	£31,875	-£159,302	£31,875
7	£159,302	£77,806	£12,151	£14,143	£25,264	£52,438	£34,136	-£125,166	£34,136
8	£125,166	£79,368	£9,262	£14,446	£23,178	£56,181	£36,517	-£88,649	£36,517
9	£88,649	£80,945	£6,205	£14,704	£20,910	£60,036	£39,023	-£49,625	£39,023
10	£49,625	£82,564	£3,474	£14,938	£18,472	£64,052	£41,660	-£7,965	£41,660
11	£7,965	£84,218	£0	£15,200	£15,866	£68,360	£44,434	£36,466	£44,434
12	£0	£85,900	£0	£15,604	£15,604	£70,295	£45,692	£82,158	£0
13	£0	£87,618	£0	£15,916	£15,916	£71,701	£46,606	£128,764	£0
14	£0	£89,370	£0	£16,235	£16,235	£73,138	£47,538	£176,304	£0
15	£0	£91,158	£0	£16,569	£16,569	£74,698	£48,480	£224,784	£0
16	£0	£92,981	£0	£16,891	£16,891	£76,380	£49,453	£274,257	£0
17	£0	£94,840	£0	£17,228	£17,228	£77,612	£50,448	£324,699	£0
18	£0	£96,737	£0	£17,573	£17,573	£79,164	£51,457	£376,156	£0
19	£0	£98,672	£0	£17,924	£17,924	£80,747	£52,481	£428,642	£0
20	£0	£100,645	£0	£18,283	£18,283	£82,362	£53,536	£482,177	£0