

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											
Annual mean flow	Annual Q95 (m³/s)	P (%)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
0.22 m³/s	0.13	0.22	0.22 m³/s	0.19 m³/s	0.18 m³/s	0.12 m³/s	0.078 m³/s	0.056 m³/s	0.050 m³/s	0.068 m³/s	0.098 m³/s	0.16 m³/s	0.18 m³/s	0.20 m³/s
0.058 m³/s	0.025	0.058	0.058 m³/s	0.042 m³/s	0.044 m³/s	0.044 m³/s	0.029 m³/s	0.021 m³/s	0.018 m³/s	0.018 m³/s	0.020 m³/s	0.034 m³/s	0.043 m³/s	0.050 m³/s
1	5	0.22	0.597	0.661	0.513	0.32	0.203	0.138	0.13	0.219	0.336	0.468	0.506	0.561
2	10	0.19	0.447	0.414	0.378	0.237	0.144	0.105	0.093	0.154	0.233	0.357	0.384	0.422
3	20	0.18	0.317	0.269	0.254	0.163	0.098	0.072	0.061	0.094	0.141	0.238	0.27	0.286
4	30	0.12	0.234	0.198	0.193	0.129	0.078	0.059	0.048	0.064	0.099	0.182	0.206	0.218
5	40	0.078	0.189	0.162	0.154	0.108	0.066	0.049	0.041	0.048	0.074	0.138	0.161	0.174
6	50	0.056	0.156	0.132	0.121	0.093	0.058	0.042	0.037	0.039	0.058	0.111	0.123	0.135
7	60	0.05	0.126	0.106	0.096	0.079	0.049	0.036	0.033	0.034	0.047	0.089	0.099	0.115
8	70	0.068	0.103	0.079	0.076	0.067	0.043	0.032	0.029	0.029	0.038	0.068	0.081	0.094
9	80	0.098	0.085	0.058	0.065	0.059	0.037	0.029	0.025	0.025	0.031	0.051	0.068	0.075
10	90	0.16	0.067	0.047	0.053	0.049	0.032	0.025	0.021	0.02	0.024	0.04	0.053	0.059
11	95	0.16	0.068	0.042	0.044	0.044	0.029	0.021	0.018	0.018	0.02	0.034	0.043	0.05
12	99	0.2	0.047	0.036	0.035	0.038	0.025	0.018	0.016	0.017	0.017	0.029	0.036	0.041

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

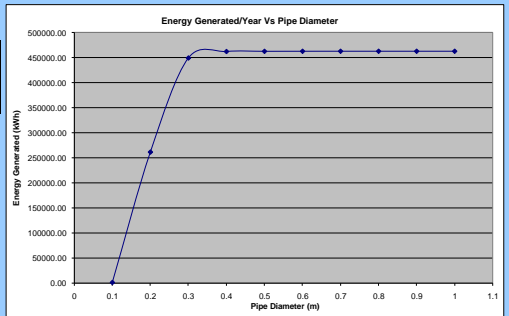
Feed-in Tariff

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	978.47	£203.52
0.2	26143.95	£54374.10
0.3	449373.52	£93469.69
0.4	462348.18	£96168.42
0.5	462892.24	£96299.99
0.6	462796.76	£96261.73
0.7	462835.83	£96269.85
0.8	462852.72	£96273.36
0.9	462860.94	£96275.06
1	462865.09	£96275.94



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	£310,823	993,470	£21,758	£11,150	£32,908	660,562	£39,365	-£271,458	£39,365
2	£271,458	995,339	£19,002	£11,373	£30,375	£64,964	£42,227	-£229,231	£42,227
3	£229,231	997,246	£16,946	£11,600	£27,547	£92,599	£46,240	-£183,992	£46,240
4	£183,992	999,191	£14,978	£11,834	£24,712	£74,473	£49,411	-£135,581	£49,411
5	£135,580	£1,011,175	£9,491	£12,069	£21,560	£79,615	£51,750	-£83,831	£51,750
6	£83,831	£1,031,198	£5,868	£12,311	£18,170	£85,019	£55,263	-£28,568	£55,263
7	£28,568	£1,052,264	£2,000	£12,557	£14,556	£91,706	£58,958	£30,391	£58,958
8	£0	£1,073,367	£0	£12,808	£10,808	£94,559	£63,464	£93,854	£0
9	£0	£1,094,515	£0	£13,064	£13,064	£96,451	£62,693	£154,547	£0
10	£0	£1,115,705	£0	£13,325	£13,325	£98,380	£63,947	£218,494	£0
11	£0	£1,136,939	£0	£13,592	£13,592	£100,347	£65,226	£283,720	£0
12	£0	£1,158,218	£0	£13,864	£13,864	£102,354	£66,530	£350,250	£0
13	£0	£1,185,542	£0	£14,141	£14,141	£104,401	£67,861	£418,111	£0
14	£0	£1,209,913	£0	£14,424	£14,424	£106,488	£69,218	£487,329	£0
15	£0	£1,233,331	£0	£14,713	£14,713	£108,619	£70,602	£557,931	£0
16	£0	£1,255,798	£0	£15,006	£15,006	£110,791	£72,014	£629,946	£0
17	£0	£1,282,314	£0	£15,307	£15,307	£113,007	£73,455	£703,400	£0
18	£0	£1,303,880	£0	£15,613	£15,613	£115,267	£74,924	£778,324	£0
19	£0	£1,333,493	£0	£15,925	£15,925	£117,571	£76,421	£854,745	£0
20	£0	£1,368,168	£0	£16,243	£16,243	£119,924	£77,951	£932,697	£0