

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	0.057	0.061	0.0513	0.032	0.0203	0.0138	0.013	0.0219	0.0336	0.0468	0.0506	0.0561
Q (m³/s)	0.447	0.414	0.378	0.237	0.144	0.105	0.093	0.154	0.233	0.357	0.384	0.422
Q (m³/s)	0.317	0.269	0.254	0.163	0.098	0.072	0.061	0.094	0.141	0.238	0.27	0.286
Q (m³/s)	0.234	0.198	0.193	0.129	0.078	0.059	0.048	0.064	0.099	0.182	0.206	0.218
Q (m³/s)	0.189	0.162	0.154	0.108	0.066	0.049	0.041	0.048	0.074	0.138	0.161	0.174
Q (m³/s)	0.156	0.132	0.121	0.093	0.058	0.042	0.037	0.039	0.058	0.111	0.123	0.135
Q (m³/s)	0.126	0.106	0.096	0.079	0.049	0.036	0.033	0.034	0.047	0.089	0.099	0.115
Q (m³/s)	0.103	0.079	0.076	0.067	0.043	0.032	0.029	0.029	0.038	0.068	0.081	0.094
Q (m³/s)	0.085	0.058	0.065	0.059	0.037	0.029	0.025	0.025	0.031	0.051	0.068	0.075
Q (m³/s)	0.067	0.047	0.053	0.049	0.032	0.025	0.021	0.02	0.024	0.04	0.053	0.059
Q (m³/s)	0.058	0.042	0.044	0.044	0.029	0.021	0.018	0.018	0.022	0.034	0.043	0.05
Q (m³/s)	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)

Turbine 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

Groundwork/Power House

Transmission Distance (km)

Overhead

Underground

Est. Transmission Cost

Est. CapEx

Est. OpEx

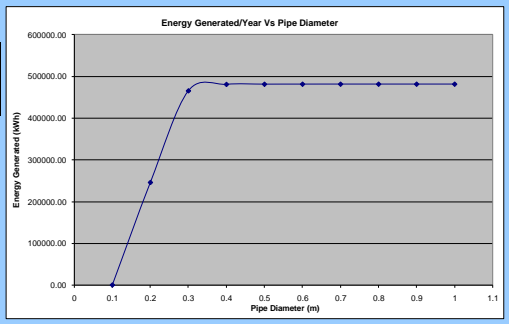
Feed-in Tariff

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	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	£100,226.00
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	£875,623	£96,920	£81,294	£11,850	£73,144	£23,778	£15,455	-£860,168	£15,455
2	£860,168	£98,858	£80,212	£12,087	£72,299	£26,560	£17,264	-£842,905	£17,264
3	£842,905	£100,835	£79,003	£12,369	£71,362	£29,500	£19,177	-£824,728	£19,177
4	£823,728	£102,851	£77,661	£12,679	£70,236	£32,616	£21,200	-£805,527	£21,200
5	£802,527	£104,900	£76,177	£12,927	£69,004	£35,905	£23,330	-£779,180	£23,330
6	£779,180	£107,007	£74,543	£13,083	£67,627	£39,381	£25,598	-£753,591	£25,598
7	£753,591	£109,148	£72,751	£13,345	£66,068	£43,051	£27,983	-£728,608	£27,983
8	£725,908	£111,330	£70,793	£13,612	£64,404	£46,926	£30,500	-£704,108	£30,500
9	£695,106	£113,557	£68,657	£13,884	£62,542	£51,016	£33,160	-£680,948	£33,160
10	£661,946	£115,828	£66,336	£14,162	£60,498	£55,330	£35,965	-£658,981	£35,965
11	£626,381	£118,145	£63,819	£14,445	£58,264	£59,881	£38,924	-£637,058	£38,924
12	£587,958	£120,508	£61,084	£14,734	£55,929	£64,680	£42,042	-£615,017	£42,042
13	£545,917	£122,918	£58,151	£15,029	£53,180	£69,738	£45,330	-£499,687	£45,330
14	£499,687	£125,376	£54,978	£15,329	£50,307	£75,069	£48,795	-£450,892	£48,795
15	£450,892	£127,881	£51,562	£15,636	£47,198	£80,685	£52,446	-£398,447	£52,446
16	£398,447	£130,441	£47,891	£15,949	£43,840	£86,602	£56,291	-£342,156	£56,291
17	£342,156	£133,050	£43,951	£16,268	£40,218	£92,832	£60,341	-£281,815	£60,341
18	£281,815	£135,711	£39,727	£16,593	£36,320	£99,381	£64,604	-£217,211	£64,604
19	£217,211	£138,425	£35,205	£16,925	£32,120	£106,296	£69,000	-£148,193	£69,000
20	£148,193	£141,194	£30,368	£17,263	£27,631	£113,563	£73,816	-£74,303	£73,816